COMPUTERWORLD

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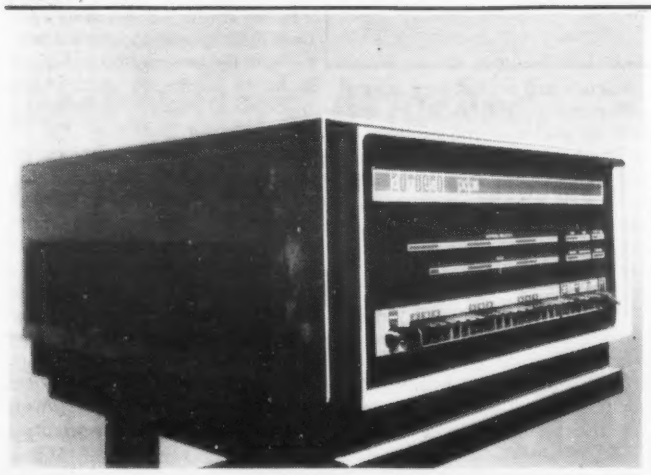

Newest small computer family from Digital Equipment Corp. is the 16-bit PDP-11. It is initially being offered as a general purpose computer and a special purpose controller.

New DEC 16-Bit Line Has Modular Design

By Christine Magnuson
CW Staff Writer

MAYNARD, Mass. – A high speed bi-directional data path (called a Unibus), said to be immune to technological obsolescence, is a main feature of the PDP-11 family of small, 16-bit computers announced by Digital Equipment Corp. last week.

All computer components of the PDP-11 are interfaced to the Unibus, with the central processor, core memory, and peripheral devices considered as subassemblies, making the system physically and electronically modular, the firm says. With the Unibus, some peripherals can interact with one another without having to transfer data through the central processor.

The Unibus permits more than one task to be carried out in the computer simultaneously under some circumstances, according to Andrew Knowles, PDP-11 product line manager.

"Advance in technology will not affect the PDP-11," continued Knowles. "If there is a breakthrough in processor or memory technology, a customer need only replace that component, not the entire computer."

Two Models

Two models of the PDP-11 will be offered intitially. The PDP-11/20 is a general purpose computer with central processor, 4,096 words of standard core memory expandable in 4,096-word increments to 32,768 words, programmer control panel, and teletypewriter input/output device.

The PDP-11/10 is a dedicated controller equipped with a central processor, 1,024 words of 16-bit read-only memory (expandable in 1,024-word increments), and 128 words of standard memory (expandable in 128-word blocks).

The PDP-11 will not replace the company's PDP-8 small computer family, according to Nick J. Mazzorese, a DEC vice-president. "The PDP-11 gives us a 16-bit, byte-oriented computer that complements the 12-bit PDP-8 line," Mazzarese said.

Although DEC refers to the PDP-11 as byte-oriented, more conventional terminology would refer to it as half-word-oriented. The internal representation of data in core is pure binary with no hardware facilities for performing decimal arithmetic.

DEC states that radix conversion will be performed by software subroutines included in the utility package.

Other features of the PDP-11 are four levels of vectored priority interrupt and eight general registers. Knowles said that all general registers "are program accessible and can be used as accumulators, pointers to memory locations, or full-word index registers, so that a customer can tailor the PDP-11 to fit the problem."

(Continued to Page 2)

On the Inside

Afips Ups Most JCC Fees, Will Limit Exhibition Size

By Edward J. Bride
CW Staff Writer

MONTVALE, N.J. – Exhibit limitations, crowd control measures, and some increased registration fees have been announced for future Joint Computer Conferences.

Dr. Richard I. Tanaka, president of the American Federation of Information Processing Societies (Afips), conference sponsor, said that future exhibitions will be held "to a maximum of 1,000 booths."

Tanaka also announced an increase in conference registration from $30 to $40, although fees for members of Afips' constituent societies will remain at $20.

$0 or $40; No "Walk-ins"

Paid registration for exhibits-only will be eliminated, in an attempt to reduce the "marginal-interest type" attendee, according to Charles Asmus, Afips executive director.

In other words, former "walk-in" visitors used to paying only $5 must now obtain "exhibitor guest" passes or pay $40.

Figures for the fall conference are not available, but fewer than 10% of the 35 thousand 1969 SJCC attendees were "walk-ins." Over 20 thousand of the spring attendees were exhibitors and their "guests."

Full-time students, who numbered 1,200 last spring, will pay $5, up from $3.

As usual, registration fees for members and non-members of Afips societies (not student fees) will include one copy of the Conference Proceedings.

All changes will be in effect for the 1970 Spring Joint Computer Conference, to be held May 5-7 in Atlantic City.

JCC's Serve Afips Members

According to Asmus, the oft-stated purpose of the conferences is to "serve the membership" of Afips societies. The crowd control to be accomplished by eliminating some exhibit-only registrants should serve this end, he added.

Asmus said that the paid registrant should now get a "better access to exhibitor presentations than what he has historically been able to get."

He foresaw the potential deterrence of 5,000 walk-ins for Atlantic City; Boston walk-ins numbered 3,400.

Asmus said that anticipated complaints from unaware "walk-in" visitors should be outweighed by advantages in crowd control.

Exhibit Contracts Past Due

The deadline for exhibitors contracts is past, although there are still some applications filtering in to Afips headquarters here.

A review will be made shortly, to determine what cuts, if any, need to be made to adhere to the 1,000-booth limitation.

(Continued to Page 2)

Proposed Data Base Language To Allow Inter-Language Mixing

By Drake Lundell
CW New York Bureau

NEW YORK – Guidelines that one day may give users of differing computers a standard language for accessing common data bases have been released for comments by the Data Base Task Group of the Conference on Data Systems Languages (Codasyl).

But initial reactions indicate the recommendations contained in the report will be subjected to close scrutiny and some political infighting among the computer manufacturers before possible adoption as official standards by Codasyl's Programming Language Committee (PLC).

The report contains proposals and specifications for a new Data Description Language specifically for describing a data base and a new Data Manipulation Language.

The Data Manipulation Language is intended to permit manipulation of data bases when associated with the facilities of a host language such as Cobol, PL/1, Algol, Jovial, Fortran, etc.

This separation is the keystone of the task group's approach to data management and is said to allow the development of data bases that are processable by any language to which appropriate manipulative features have been added. The group, therefore, claims that data is not tied to any specific processing language.

Group's Recommendations

According to the Data Base Task Group, the recommendations will:

- Allow data to be structured in the manner most suitable to each application, regardless of the fact that some or all of the data may be used by other applications.
- Allow more than one run-unit to concurrently retrieve or update the data in the data base.
- Provide and permit the use of a variety of access methods

(Continued to Page 2)

Burglary Spotlights CW's New York Office Opening

NEW YORK – The official opening of *Computerworld*'s new East Coast news bureau was celebrated in a typical New York City fashion – with a burglary.

The office in Suite 4C at 120 E. 34th St. was ransacked sometime between Dec. 24 and Dec. 29 while the staff was celebrating Christmas.

The new bureau, under the direction of E. Drake Lundell Jr., a veteran writer and editor in the data processing field, will enable *Computerworld* to provide more direct coverage of news in the New York-Washington-Philadelphia area. The East Coast formerly was covered by correspondents and by staff members from *Computerworld*'s Newton, Mass., home office.

Lundell formerly was editor of *EDP Weekly* and *Peripherals Weekly* and managing editor of *EDP Daily*, newsletters published by EDP News Services, Inc. He also was the Washington, D.C., columnist for *Computer Decisions* magazine.

The New York office also houses *Computerworld*'s eastern regional advertising staff, headed by Donald Fagan.

Computerworld maintains a West Coast news bureau at 11661 San Vicente, Los Angeles. The activities of this bureau are directed by Phyllis Huggins, former editor-publisher of *Computing Newsline*, a newsletter.

POSTMASTER: CHANGE OF ADDRESS FORM 3579 to be sent to Computerworld Circulation Dept., 797 Washington, Newton, Mass. 02160.

AAAS's Tranquility Is Challenged

By Joseph Hanlon
CW Staff Writer

BOSTON – Village officials in Vietnam are being assassinated by U.S. soldiers as a direct result of a computerized war game, charged David Guttman at the annual meeting of the American Association for the Advancement of Science (AAAS).

AAAS meetings are traditionally quiet presentations of dry technical papers, but not this year. Guttman's charge was typical of the new concern for the effects of science and technology shown at this meeting.

Student protestors as well as regular speakers repeatedly questioned the old assumptions about the neutrality of science and technology, and urged scientists to consider the social implications of the work.

Although most strongly shown by the protests of the students, the planning of the conference also reflected this new concern: over 40 sessions were scheduled on such topics as disarmament, pollution, and over-population.

Student Critique

Guttman spoke as part of a session "The Sorry State of Science," billed as a "student critique." He charged that the Phoenix Project, in which U.S. soldiers are directed to assassinate village leaders suspected of being Viet Cong sympathizers, was a direct result of Defense Department experience with Agile-Coin, a computerized war game.

Agile-Coin was developed several years ago by Abt Associates of Cambridge, Mass. Guttman reported that at one time he worked for Abt.

Agile-Coin attempts to determine the effects of peasant loyalty of various military acts, such as the drafting of villagers or the kidnapping or killing of officials.

'Technology is Political'

Although only one session was billed as a student critique, in fact the entire AAAS meeting became a student critique of science and technology.

Additional coverage of computer-related events at the AAAS meeting appears on pages 4 and 6.

Science and technology are not autonomous, apolitical, or neutral, according to the students. It is being misused by the military and industry at the expense of such areas as public health, education, housing, and transportation.

'Big Business' Benefits

Allen S. Weinrub, a leader of the group, charged the science and technology is controlled by government and big business for their own benefit, rather than for the benefit of the people. "The producers of technological change are very much in charge of that change; technology is not autonomous. But society has no control."

At their own meeting, the students stressed the misuse of technology in several specific areas, including the drug industry, the computer industry, and the space race.

In addition to holding their own official session, the students repeatedly interrupted other sessions to challenge assumptions of political neutrality, or just to ask pertinent questions that scientists at AAAS meetings are usually too polite to ask.

Reaction among the 7,000 conference participants was mixed. By the end of the conference, many people were wearing the students' "Science for the People" buttons and felt that the students had done a good job in raising important questions. But others criticized the students, arguing that they were challenging traditional scientific objectivity.

Data Base Language Faces Political Battle

(Continued from Page 1)

against an entire data base or portions of a data base.

- Provide protection of the data base against unauthorized access of data and from untoward interaction of programs.
- Allow the user to plan and implement his system as if he had a virtual memory at his disposal.
- Provide the data base manager with the capability to control the physical placement of data.
- Allow the declaration of a variety of data structures ranging from those in which no connection exists between the data elements to network structures.
- Allow the user to interact with the data while being relieved of all of the mechanics of maintaining the structural associations which have been declared.
- Allow programs to be as independent of the data as current techniques will permit.

In addition, the group claims that in developing its proposals "special attention" was given to developing proposals that were "currently implementable."

The task group also said it was "careful to avoid concepts and proposals which it considered to be unattainable within the present state of technological development."

Political Fight Seen

While the report has just been issued to the computer community for comment, political factors that may hinder its adoption have already come to light in the behind-the-scenes maneuvering within both the task group and the Programming Language Committee.

The major force in the industry to oppose the present report as it stands is IBM, which filed a minority report on the issue of data bases to the task group.

This move by the industry giant was rejected by the task group, but IBM may not have given up the fight yet.

While IBM officials involved said the firm was "currently reviewing" its next moves, other committee sources indicated that IBM would continue to object to the report.

According to these sources, the IBM minority report described a data management language already in the works at IBM.

Since this is said to differ from the group's recommendations, IBM is 'almost certain to continue the fight, the sources said.

Honeywell and NCR also reportedly offered proposals that differed from the group's final report.

Honeywell is said to have proposed a delay in adoption of the report so that it could be studied further, while NCR pushed for a new avenue of study before adoption.

Group/PLC Differ

Other sources in the group indicate that there is also a difference of opinion between the group and its parent body, the Programming Languages Committee, about the value of the present report.

These sources said the group asked PLC to issue the report as a Type A release, which would have given full Codasyl support and backing to the group's action. Type A releases indicate official committee approval and are entered into the Codasyl specifications, which are used as input to the American National Standards Institute's standardization program.

Instead, the committee reportedly asked the group to release the report as a Type B action, which does not carry the weight of official approval and only opens the issue to industry-wide scrutiny and comment. This could be construed as a mild rebuke to the group, according to these sources.

The entire report is now available at $4 a copy from ACM at 1133 Avenue of the Americas, New York, N.Y. 10036. Industry comments are due by March 15.

PDP-11 Computers To Use Multitask Transfer Path

(Continued from Page 1)

Double operand addressing and 65 functional instructions, which yield, according to DEC, over 400 usable instructions, are offered with the PDP-11. With the double operand capability, every memory location can be treated as a accumulator, reducing the length of programs and time to develop them by eliminating load and store operations, according to the company.

The PDP-11/20 is directly byte and word addressable to 65,576 eight-bit bytes or 32,768 words. Cycle time is 1.2 μsec., with an access time of 500 nsec.

The PDP-11/10 read-only memory has a cycle time of one microsecond and access time of 500 nsec.

Direct memory access is 833,000 words a second. Unibus transfer rate is 1.3 million words a second.

Software available includes macro-assembler, editor, debugging routines, input/output handlers, and a relocatable integer and floating point mathematics library.

Knowles said that the PDP-11 should have widespread appeal where an eight-bit byte is attractive. He visualized the machine being used in real-time to communicate with larger computers, with large mass storage devices, with character-oriented display devices, and as a remote terminal.

Application areas include data communications, data processing management information, and industrial data acquisition and control, Knowles said. The PDP-11 should have special appeal to users who wish to combine it with their own equipment in a computer-based system, he added.

The PDP-11s will be available in April at $7,700 for the PDP-11/10 and $10,800 for the PDP-11/20, according to the company. Both prices include software, automatic power fail protection and restart, full priority interrupt, direct memory access, and customer familiarization training, the firm said.

Afips Limits JCC Exhibits

(Continued from Page 1)

A "booth" is a 10 ft by 10 ft section. At the FJCC Las Vegas fewer than 400 exhibitors occupied the 1,008 booth.

Allocation will be made on various bases, such as date of receipt of contract, past participation, and some "judgment." Asmus said that, as in the past, there will be an "overt, willful motivation" to allocate at least 10% of the floor space to first-time applicants.

For the first time, Afips is requiring a 50% deposit for exhibitors, in an attempt to discourage dropouts.

Experience shows that anywhere from 6% to 15% of applicants fail to show, and this deposit should help reduce that number.

Afips is also requiring the equivalent of a single night's room deposit for each hotel accommodation. The deposit is refundable up to 48 hours before the conference. The intention is to discourage double-reservations by attendees and overbooking by hotels.

Asmus cautioned that attendees are "notoriously late bookers" for hotel and transportation accommodations, but that problems could be alleviated by foresight.

He said Afips had been in touch with every major air carrier which serves Philadelphia, and that extra flights and chartered ground transportation should ease the usual bottleneck.

IBM Develops an Inexpensive 16 MBit Laser Memory

By Peter L. Briggs
CW Software Editor

HOUSTON – IBM apparently has a workable optical read-only memory (ROM) well on the way to being marketable. The system was described in a paper presented at a scientific conference here.

The memory permanently stores some 16 megabytes on four fixed-position holographic plates and has an average access time of 50 nsec/word (four bytes).

The holographic-plate memory could be used to facilitate program distribution, operating systems residence, microprogramming storage, and large data base storage, according to John Lipp of IBM Poughkeepsie, the man presenting the paper.

Lipp said that IBM expects to have the prototype working near the end of January, though he could make no guesses as to when such a device might become commercially available. Marketing considerations, pricing (a low price was considered as a design parameter), and production planning were not discussed.

Read-Only Memory

The operating unit is a read-only memory, but it is combined with an inexpensive device for making the photographic holograms used to store the data.

One of the largest problems in such devices, that of positioning the holographic plate for reading, is completely eliminated by having four plates in permanent "carriers." The plates are mounted in the carrier, before information is recorded, and never removed.

All accessing is done through control of a laser beam, and electronic selection of the desired bits on the holographic image. There are no moving parts anywhere in the unit, according to Lipp.

Technical Specifications

All detection is done through integrated silicon photodetectors, arranged in a 64- by 72-bit array. Each plate contains an array of 16 million bits with access times of 2 μsec. Data is arranged logically, as opposed to physically, in 512-bit blocks with a transfer rate of 51.2 megabyte/sec, Lipp said.

The four plates, in carriers, are mounted in the ROM unit. The optical path is imbedded in a medium of carefully matched refractive index, to minimize dispersion and light loss.

The Conference

The paper, prepared jointly by Lipp and J. Reynolds, both of IBM Poughkeepsie, was presented at the Holography and the Computer conference held here at the IBM Scientific Center. The conference, with over 300 attendees from around the world, was jointly sponsored by the IBM Houston Scientific Center and the Gulf Coast Optical Society of America.

Blockbusters Attacked, EDP to Pinpoint Violators

BALTIMORE, Md. – A group of civil rights workers here plans to use computer techniques to pinpoint "blockbusters" and their financial backers.

A spokesman for the group, Activists Inc., said, "We will use the tools that they use."

Rev. John Martinez, a Jesuit priest who heads Activists' Housing Committee, said the study would cost about $7,000 and would be undertaken by an outside contractor using data collected by Activists' members.

Martinez said the group plans to record all transfer of deeds within Baltimore for the past five years in order to discover which realtors were using racial fears to buy real estate from whites at low prices and sell it at high prices to blacks in the city.

He said that his group had already held preliminary discussions with Computer Business Applications Inc. of Philadelphia, but that no contract has been signed.

In addition, he said the group hopes to discover which Baltimore banks are the largest financial backers of the blockbusters.

Martinez claimed that large commercial banks in Baltimore invest between $10 and $15 million per year in changing neighborhoods through blockbusters.

Many of the city's savings and loan institutions also make large sums from the activities of the blockbusters by buying first mortgages on homes when they are taken over by black tenants, Martinez claimed.

Activists will recruit at least 250 volunteers to gather the data from more than 4,200 suspected streets in Baltimore, he said.

The volunteers will also gather data on the activities of more than 100 commercial banks and several hundred saving and loan institutions, he said.

Data from the study will be used in a suit that was recently instituted by 76 black homeowners against alleged blockbusters.

Through the data gathered, Activists hopes to find other home owners that are disgruntled with the arrangements set by the blockbusters to join in the suit.

They also hope to gain more information on the realtors and banks involved, Martinez said. The suit alleges that the blockbusters and their backers are guilty of discrimination in housing, violation of the antitrust laws, and fraud.

Spokesmen for Computer Business Applications indicated that the $7,000 price tag for the service would just cover their programming, keypunching, and computer costs if they land the proposed contract.

Scientists Debate Need for Regulation of Data Banks

By Joseph Hanlon
CW Staff Writer

BOSTON – The computer industry eventually may be regulated as extensively as the airlines in order to control data banks and protect privacy, declared Arthur Miller.

The University of Michigan law professor was speaking at a session on the Organization of Statistical Systems at the annual meeting of the American Association for the Advancement of Science (AAAS).

All of the speakers agreed that in an increasingly complex society that expects more and more from its government, detailed planning is necessary, and planning will require more data collection and computerized data banks. But there was sharp disagreement on the type of data to be collected and the need for regulation.

Typical of the divergence of opinion were the comments on the 1970 census, which will include 140 questions such as "Do you have a tub or shower, and do you share it with anyone?" Miller called it part of the expansion of "intrusive" government questionnaires. Ezra Glaser of the U.S. Office of Education praised the census and did not consider it at all intrusive.

Glaser went on to call for a federal statistical system which would interconnect all of the present government data banks. Further, he argued for keeping individual records rather than statistical summaries, saying that only by going back to the individual dossiers can one develop accurate statistical evaluations of the effect of federal programs.

Data Bank Ban 'Ostrich-Like'

"I don't oppose the computerization of data," declared Miller. "It would be ostrich-like to ban the use of technology just because it might be abused.

"An increasingly urbanized society cannot survive too many more years without planning.

"We live in an increasingly information-based society. Everyone wants more data. Access to government largesse, such as welfare, has increasingly depended on a person's willingness to disclose private information," he continued.

"We must strike a balance," he declared. "To date, the information system planners have been impervious to questions of privacy."

No Controls, No Regulation

"The current system has no controls and no regulations" on the collection, use, and exchange of data, Miller charged. "The federal government can collect any damn thing it wants. There is no limit."

Furthermore, there is poor regulation of access to supposedly confidential information, he said. One example is the FBI's crime information center. "I know of desk sergeants who play 'dial a name' to see if the FBI has rap sheets on any of their neighbors," he said.

Finally, Miller is concerned about distortions in the collection and exchange of data. Some data is accurate only contextually, he said, but when exchanged is taken out of context.

Citing the FBI system again, he told of a law colleague whose FBI "rap sheet" contains only the word "felony" followed by the length of the prison sentence. What the rap sheet doesn't say is that the felony was for refusing induction into the military, and that the man was a conscientious objector.

'Reaction Setting In'

"But congressional reaction is now setting in," Miller declared. Several Senators have already proposed regulations of some areas, including the census, other federal questionnaires, and credit bureaus.

Sen. Sam Ervin (D-N.C.) is now considering a blanket approach, according to Miller, "He comes in with a large cannon." Although the bill will probably not be proposed for at least a year, Miller said that it will involve broad regulation of the entire industry "from the hardware manufacturing end through to the remote terminal end," and he suggested that it might be similar to present regulation of the airline industry.

Present Laws Adequate

An opposite view is taken by Glaser. He feels that present laws are adequate to control abuses, "There are some long standing statutory prohibitions against federal employees revealing information," and he said that those laws work well.

The real problem in his opinion is to insure accuracy and to make sure that various systems are compatible. "We have a lot of reporting systems, but as soon as you try to use two of them together, you run into trouble," Glaser declared.

"The pieces are not designed to go together as a statistical system."

Two forces make the design of a statistical system a priority item, according to Glaser, "the rising expectation that governments . . . must deal with the unsolved problems" and the "demand that modern management methods be applied to assure that large sums of money are well spent."

"The programmatic and evaluative studies generated by these expectations . . . create large scale demands for organized and interrelated information, almost as a matter of definition," he said.

Must Use 'Individual Records'

All of the appropriate data can be collected specially for each study, but it is much more efficient to try to correlate existing studies.

If one is trying to assess the effect of a program, the information must be related to the appropriate individuals, families, or households, Glaser said.

This means systems must be set up so that "the information from two or more reporting systems can be matched *for the*

(Continued on Page 6)

Astronauts Control Lunar Module on Graphic Display

By a CW Staff Writer

BOSTON – On the screen the lunar module circles behind the mother space craft and then docks. The pictures are in full color, and look like a well done animated film.

But it's not a film – it's a computer-aided graphic display operating in real-time in response to an astronaut trainee at the controls of a lunar module simulator.

'Hidden Lines' Deleted

When the astronaut "flies" the lunar module behind the mother ship, the computer automatically deletes the lines from the part of the module that should be hidden from view, so that on the screen the module really does appear to be going behind the mother ship.

Films of this display and others called the most advanced in the world were shown at the American Association for the Advancement of Science annual meeting by John W. Brackett, director of education for SofTech of Waltham, Mass. The technical program was "Electronic Computers – Today and Tomorrow," sponsored by the Association for Computing Machinery.

Picture Rotates

Another display system shown in the film is currently in use at the biological science department of Columbia University. Highly complex molecules with 2,000 or more atoms can be displayed flicker free on the screen in three dimensions, and the picture can be rotated so that all sides of the molecule can be viewed.

To make the picture three dimensional, any of three techniques can be combined: 1) perspective, things father away are made smaller, 2) shading, things farther away are made darker, or 3) stereo pairs, two pictures are displayed (one for each eye), one slightly rotated with respect to the other, and are looked at through a viewer. In all cases the computer automatically changes the display so that as the image rotates, the perspective or shading is corrected.

The Columbia system uses an Adage 50 graphics terminal ($250,000) tied to an IBM 360/91. The computer is used to calculate the coordinate positions of the atoms within the molecule (about one minute of 91 time is required for a large molecule). The Adage 50 stores this information and does all calculations required for displaying the molecule and doing the rotation.

In a telephone interview, Dr. Louis Katz, director of computer graphics in the Columbia biological science department, explained that it is impossible to understand complicated molecules without some sort of visualization. Traditionally, large wire models are built, but this becomes awkward for large molecules. Only by looking at such a picture is it possible to tell, for example, which parts of the molecule are on the outside and are able to react with other molecules, and which parts are buried inside and are hidden from other molecules.

Used by Architects

The Columbia system is also being used by architects, according to Katz. "It is possible to design aesthetically, and have the computer keep track of important parameters. When he is designing a building, the architect can change dimensions in real-time and keep track of things like square footage," Katz said.

Isn't such a system too expensive for practical use? Katz says no. "Just consider the cost of changes after the building is finished. If you could cut the cost of changes in half, you could pay for an Adage 50."

So far, uses such as this are just experimental, and a great deal of software will have to be created to make this system useful for the average architect or city planner. But Brackett said that he expects to see many such uses within five years.

Color System Cost $2,000,000

The color system used for the lunar module simulation is by far the most advanced computer graphic system ever built. It was constructed by GE two years ago for the National Aeronautics and Space Administration at a cost estimated at over $2 million.

Nasa is not using the system for astronaut training, according to GE spokesmen, but rather for testing vehicle characteristics. Suggested characteristics are input into the computer, and then operation of the revised simulation is studied to test the effects of the changes.

So far, GE has not sold any other systems like this one, but they are planning to market (for under $500,000) a color system that operates only partially in real-time. A picture is built up 24 lines at a time, so that an entire picture would take four seconds to create. Then a moving object, such as an airplane made up of just a few lines, could be flown through the picture in real-time.

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BPA Membership Applied For

Military Support Caused Development of Computer

By a CW Staff Writer

BOSTON – Computers were first developed only because of military support of university research, and are one of the best examples of the value of such support, reported Dr. Charles W. Shilling to the American Association for the Advancement of Science.

"IBM came into the picture later," noted Shilling, but only "after research support by the military had demonstrated the enormous value of the computer."

The Army Ordinance Department funded much of the early work, Shilling said, including the development of Eniac and Edvac at the University of Pennsylvania and Illiac I at the University of Illinois.

Other military funding supported the development of Whirlwind at MIT, and supported John Von Neuman's theoretical work at Princeton.

"The history of military support of university research demonstrates conclusively that the universities can be materially strengthened," concluded Shilling.

Nelson McKinney of
NCI Dallas tells how

"WORK TEN whips language overload by simplifying the complex"

"Most DP departments are moving into a more complex operational environment. Working with more data elements in more complex forms. Using more kinds of records and files. Combining functions. Going for more sophisticated applications. Creating larger and more involved programs. Using added core storage to do more things. And do them better.

"But be careful. The danger flags are flying. You can get tied in knots by demanding more and more from today's languages. They simply were not developed with all third and fourth generation problems in mind. The problems of language overload are with us. And they are expensive, frustrating and delaying.

"So we developed WORK TEN, the new computer language that makes it easy for programmers to visualize and code complex multiple file problems. That's because WORK TEN is structured and uses segmented logic to clearly define when each action occurs.

"In addition, your programmer does only the very small creative part of even the most complicated program. He tells WORK TEN what to do and when to do it. WORK TEN then creates the rest of the program automatically on the computer in COBOL. With WORK TEN, programmers use very few statements to code even the most involved tasks quickly and easily.

"This new language effortlessly handles programming elements that are staggering with ordinary languages. For example, WORK TEN automatically determines all conditions to multiply match up to 52 files. Ask your programmers how much time that alone saves. And how much simpler it makes the programming job when they don't have to worry about coding a monster like that.

"Write today for information on WORK TEN. Before you are buried in programming backlog."

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NCI

Scientists Debate Computer Regulation

(Continued from Page 4)

individual responding entities, not for counties or census enumeration districts or other subtotals," he declared. Therefore, the system should "operate with individual records," not statistical samples.

Access Problem

Access to information is the next problem that must be faced if such large computerized data banks are to be built, according to Glaser. "It is necessary to make a clear distinction between the *possession* of information about individuals and the allowing of *access* to the information to classes of persons (perhaps officials of particular agencies) under conditions that respondents might find objectionable.

The problem, then, is to provide detailed data to those working with program-related models, but to assure that others will be denied access."

Furthermore, Glaser argued that "it is practical to provide interchange in full detail of stored information to a consortium of agencies in order to enrich analysis, to avoid waste of funds, and to reduce the burden on respondents without significantly increasing the risk of unauthorized disclosure."

Rules For Dossiers

Glaser suggested several "elementary rules for the maintenance of dossiers":

- right of person to know contents of own file,
- procedure for person to correct file
- protection of individual rights "by a code of regulations," and
- protection of the individual's rights "by an enforcement agency different from the ones which operate the information systems and which perform program modeling, analysis, and evaluation."

Glaser concluded, "The techniques of statistics and of computer-operated information systems seem to provide much that is promising" in support of "the analytical activities associated with social action programs . . . while permitting a large measure of protection of individual and institutional privacy."

Model Indicates 7% Higher Rents For Apartments

By a CW Staff Writer

BOSTON – Rents on new apartments will be 7% higher because of the new tax law, declared D. Gazis, based on his computer model of apartment construction.

Gazis is a research staff member at the IBM Research Center in Yorktown Heights, N.Y., and he was speaking at the American Association for the Advancement of Science session "Quantitative Studies of Urban Problems."

According to Gazis, the old tax law allowed any owner of an apartment building to take accelerated depreciation, but the recently passed law allows only the builder, but not subsequent buyers, to do so. "In effect, this reduces the value to the buyer," he said. In order to maintain the same rate of return, Gazis' model shows that rents will have to be 7% higher than they would have been under the old tax law.

Gazis is part of a group that has constructed a computer model of the finances of a housing project for the Urban Coalition. The model contains 30 variables, including construction costs, taxes, FHA insurance, and inflation rate.

Once these variables have been set, the computer determines the profit, cost to the government, annual balance sheets for the builder, income statements, and cash flow figures.

According to Gazis, the model has two purposes. First, it can be used to study the effect of changes in public policy, such as the tax law change. Second, it is written in ordinary English and can be used by a builder to actually plan a project, and consider the outcome of various alternative strategies.

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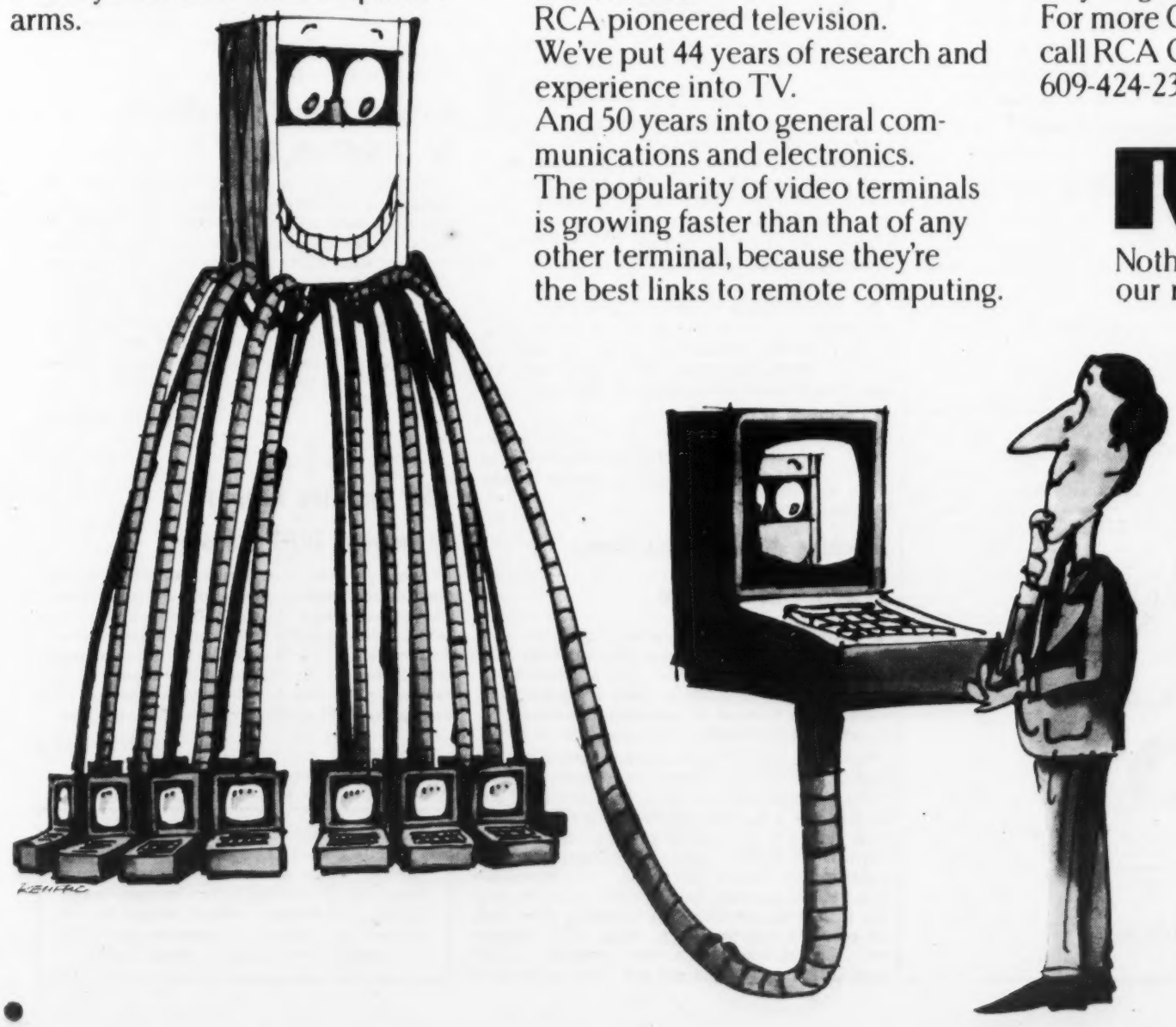


Editorials

Gigo in Vietnam

Reams of computerized statistics indicate that the Army of the Republic of Vietnam (ARVN) is indeed improving – in numbers, efficiency, and weaponry. But one must trust the computer readouts to accept that conclusion. It was forbidden, for example, for Americans to visit unannounced any Popular Force militia outpost in the Mekong Delta province of Angiang. South Vietnamese commanders reasoned that the lackadaisical militiamen might be caught napping, or doing something else unmilitary.

Washington Post, Dec. 16, 1969

Americans have unbounded faith in the reliability of machines. Unfortunately, too many of them extend this faith to the accuracy of machine output.

When the military accepts output without checking the reliability of the input and without considering that the computer program may be faulty, the danger is twofold. Not only can it lead to making bad decisions in fighting the present war, it could result in getting us into other Vietnams.

Computerized war gaming and other modeling techniques, such as those being developed under Project Cambridge, will allow Pentagon planners to try out various strategies before deciding whether to get involved in future wars.

These techniques will be available to the generals long before they are perfected. Indeed, the sponsors of Project Cambridge argue strongly that the techniques they develop will only allow very rough simulations of the real world.

But the government apparently believes the computer analysis of the ARVN and will probably believe the results of Project Cambridge simulations as well.

If we get involved in another Vietnam, it will be small comfort to have reams of printout that say it can't happen.

Treasure Hunt: 1970 Style

Letters to the Editor

Privacy Investigation Listens To Voice of Conscience

I was distressed to read the shrill attacks on Joseph Hanlon's expression of deep concern about the future of the computer industry. While no one condones the violence of Beaver 55 or wishes to encourage the mindless manifestations of neo-Luddites, the point made at Dow in such a graphic and sophisticated manner is that the computer is now widely regarded as a modern Trojan Horse. It would be more profitable for Mr. Hanlon's critics to devise ways to make their own computer applications relevant than it is for them to castigate a rather lonely voice of conscience in their industry.

Joe Hanlon needs no support from me, but for the public record, I am pleased to say that his news stories and opinions are a source of facts and insights which are invaluable to Chairman Gallagher's continuting investigations on invasion of privacy.

Charles Witter
Professional Staff Member In Charge
Right of Privacy Inquiry

House of Representatives

Teaching Method Can Make Manuals Come Alive

Editorials have been appearing in CW in recent months asking for better manuals and documentation, and not without cause. But a user must be careful that he does not develop a mental block where these manuals are concerned, because they do serve as a rich source of information.

One good way to make a manual come alive is to read it aloud by a group in seminar fashion. Managers might set aside some time during the day or schedule a Saturday to devote to this training. It is helpful if an experienced programmer or DP department member acts as chairman who can explain those points which may not come across too well. If possible, have a chalk board present for further explanation. The chairman should try to get each one present to read, try to explain what he has read, and answer questions. People tend to learn more and retain it better if more of their senses are involved and if they too participate in in the educational experience.

Thomas K. Tate
Faculty Director

Intext Computer Institute
Allentown, Pa.

National Data Banks Should Be Completely Open

Keeping a close watch for the misuse of data banks is a fine thing, but people had better start thinking ahead to what life will be like when the inclusive national data bank arrives, as it almost certainly will. Maybe instead of devising expensive security systems which can only be penetrated by those with great resources or by the agencies of government, we should think about a completely open system with no secrets. This might produce a much more rational and tolerant society. Can we hope that "The truth will make you free?"

Thomas Welling Moran

Computing Center
University of Wisconsin

PSC Clarifies Eduputer's Estimated 1970 Sales

Thank you for your article on PSC's recently announced Eduputer in the Dec. 24 issue. There is one aspect which I would like to clarify. The article states that PSC estimates Eduputer sales of $22 million for 1970. While we have estimated total sales for the Model 30 Eduputer at $22 million, we expect to sell only 10% of that total during the 1970 fiscal year.

Albert M. Loring

Programming Sciences Corp.
New York

Computerworld welcomes comments from its readers. Preference will be given to letters of 250 words or less. *Computerworld* reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, Computerworld, 797 Washington Street, Newton, Mass. 02160.

Viatron: Miracle or Mirage? - Part I

System 21 User Flexibility Tied to Options

By M.L. Stiefel
Special to Computerworld

Despite its formidable appearance, the Viatron System 21 terminal is easy to use. An operator with basic typing skills can probably become proficient after a couple of hours of instruction.

With a properly trained operator at the helm, this device can become an effective component in a surprisingly wide variety of data handling systems, as long as its use is consistent with its speed and capacity limitations.

The only required elements in each System 21 terminal are the keyboard and the logic memory section with its 400 character read/write memory. Everything else – input/output channels, tapes, display – is optional.

The terminal must have, however, at least one optional element before it can do any work. Otherwise, there is no way to retrieve the data from the memory.

Terminals Non-Changeable

A user can select precisely the modules he needs for his job, but he can't plug new elements in as the need arises. The configuration of a given terminal is established when the terminal is ordered, and it isn't changeable thereafter.

To add a module, the user must order a new terminal with the additional module, which is then traded for the old terminal. Rental of any terminal can be cancelled in 30 days, according to Viatron.

Further, there is a choice of elements in each terminal:

- 3 different keyboards
- 2 different logic and memory sections (called microprocessors by Viatron)
- 2 magnetic tape recorders (Viatape cartridges and computer compatible tape) and
- 4 different types of input/output channels (ASCII code channels, Hollerith code channels, printing robot interface, Viatron computer interface).

The user can also specify logical features that enhance the data-handling capability of System 21 in various ways.

The ways in which these features can be configured are plentiful, and sometimes startling.

$89/Mo But No Display

For $89 a month, a user has a device that enables 2-way communication between a keypunch and a telephone line.

It consists of an ASCII communication adapter, acoustical coupler, logic and memory, card punch/reader adapter, and keyboard. But there's no display here, and no magnetic tape.

For $82 a month, the user has a teletypewriter. There's a communication adapter with automatic answer feature, acoustical coupler, printing robot interface, logic and memory, and keyboard.

An IBM Selectric typewriter is needed with this device, for hard copy printout.

This configuration isn't compatible with the $89 one, however, and again, has no display and no magnetic tape.

Still another configuration may be used for capturing and key verifying data on magnetic tape. This time the display is included, along with the logic and memory, keyboard, and two Viatape units, for $55 per month.

Now for $111 a month, the user gets a terminal configuration that combines the elements of the $55 and $82 into a single unit, half key-to-tape data converter, half teletypewriter.

With this terminal, you can record and verify data during the day, and send it to a remote computer for batch processing at night.

This configuration can also be used for automatic typing, although the communication adapter, answer feature, and acoustical coupler aren't needed. So, for $80/month, the user can convert an IBM Selectric to an automatic typewriter.

If the slow communication adapter and acoustical coupler (110/247 Baud) are replaced by a 600-1200 Baud adapter and modem, the user has, for $116 a month, a teletypewriter with magnetic tape storage that can interface with the new Teletype Corp. magnetic tape terminal.

For $51 a month, with the keyboard, logic and memory, display, two Viatapes, and computer adapter, System 21 becomes a buffered computer display terminal that can interface with Viatron's $99/month and $199/month minicomputers.

Here, the terminal may be used in time-sharing applications or as a calculating machine. The computers are to be available later this year, a Viatron spokesman said.

For $95 a month, the terminal can be set up as a computer tape machine, which generates standard 7- or 9-track magnetic tape records that can be processed by non-Viatron computers.

The computer-compatible tape is worthy of further discussion, for several reasons.

Data Recorded Five Times

First, Viatron uses a unique method of recording on this tape. Each character is recorded five times, so special software is needed to decode the tapes.

Viatron says it will supply free software packages written in Cobol and Fortran to support this function.

Secondly, it should be noted that the computer-compatible tape costs 15 times as much as Viatape ($60/month vs. $4/month per channel), has five times the data capacity (3100 records vs. 624 records) but is only a little more than twice as fast in reading and writing records (0.42 second per record vs. 0.92 second per record) as Viatape.

Viatape, therefore, is a more economical storage medium than computer-compatible tape.

In operations such as random retrieval of data from sequentially stored files, moreover, it can be shown that retrieval is actually faster with the Viatape!

Viatape should always be chosen over computer-compatible tape, then, unless the data is to be processed on some non-Viatron computer.

M.L. Stiefel is an independent consultant in the area of systems design. He has had extensive computer peripheral experience.

A little over a year ago, a new data processing terminal burst upon the scene, in a series of dramatic advertisements by Viatron Computer Systems.

The ads sparked a controversy about the company and its product, System 21, which has continued unabated ever since.

Meanwhile, relatively little attention has been given to the capabilities of the equipment. What can System 21 do for a businessman? For the man who has never used electronic data processing equipment before? For the man who owns the most powerful of third generation computers? For the organization with a tab room, but no computers?

System 21 isn't truly the Everything Machine. Still, from the user without EDP equipment of any kind to the man who has it all, System 21 seems to offer a useful family of data processing tools.

It has a keyboard, display, tape, communications, a computer to interface with. The potential is there, but the questions linger on.

It's relatively inexpensive to rent, but isn't very effective for less than $75 a month.

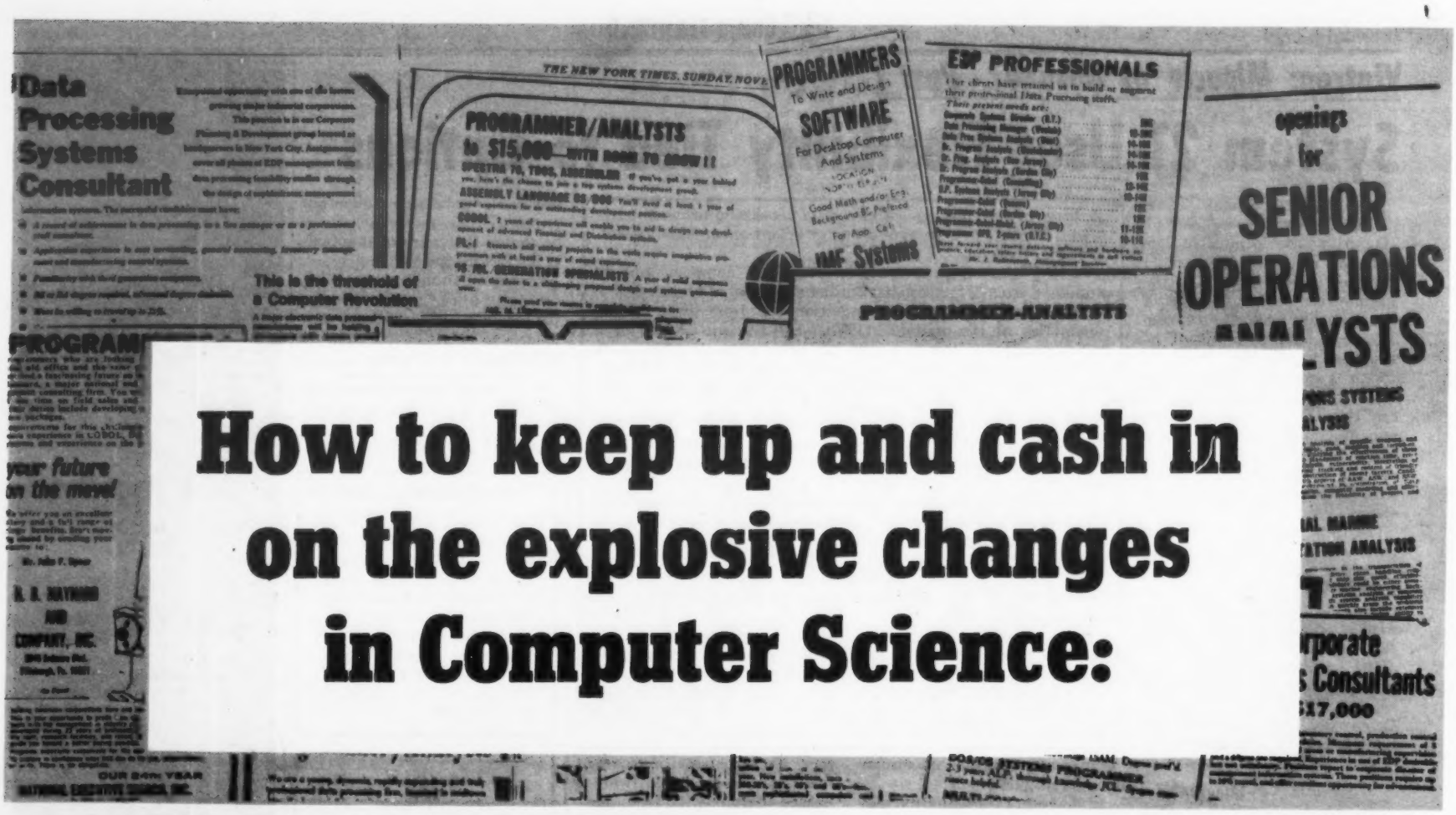
The user must pay separately and deal with a separate organization for the software to program it and its companion computer.

To get the facts the writer visited Viatron headquarters in Bedford, Mass., talked with their marketing people, and was given a demonstration of System 21 in operation.

The material for these articles was derived, for the most part, from those conversations, from an analysis of the equipment specifications, and from talking to potential users.

User Opinions Requested

Because of the intense interest generated by the System 21, CW is interested in hearing from users who have installed and evaluated the terminal. Replies should be sent to Ronald A. Frank, Technical News Editor, 797 Washington St., Newton, Mass. 02160.



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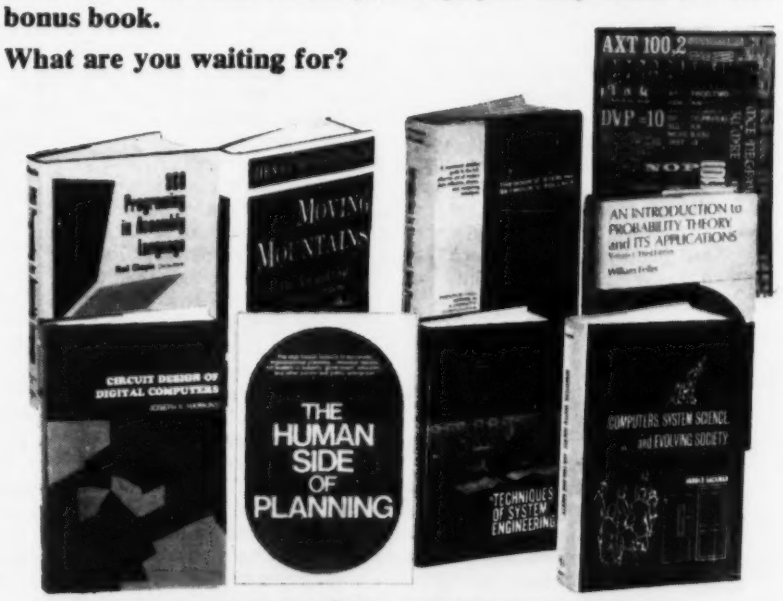

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Planned Sale of IRS Data by Zip Hit by O'Hara

By a CW Staff Writer

WASHINGTON, D.C. – "If you live in a reasonably affluent area and start getting a lot more junk mail delivered to your home, you may have the Internal Revenue Service to thank for it," charged Rep. James G. O'Hara (D-Mich.).

The IRS is selling income statistics broken down by zip code. The data will be available on tape or microfilm for $2,000 early this year. Already 20 companies have signed up, mostly large direct mail advertisers.

Early purchasers include two national magazines (*Look* and *Time*), two large mail order houses (Spiegel and Sears Roebuck), and several mailing list brokers (including Names Unlimited, American Mail Associates, and R.L. Polk).

The IRS and O'Hara agree that these mailers will use the data to select high income areas as targets for their advertising. O'Hara says that this will increase the amount of direct mail advertising going to those areas, but the IRS counters that the tapes will actually cut down the amount of junk mail, because mailers could restrict the advertising to the best markets.

Cost Unknown

IRS spokesmen were unable to estimate the cost of preparing this data, or guess how many sets of tapes would have to be sold to cover the development cost.

"The research cost is really intangible. We have a very large research program and it is just a question of programming the computer to print out zip code information," explained Frank M. Boches of the IRS Public Information Division.

There is an "apparent assumption by the IRS statisticians that if you *can* produce statistical breakdowns, you *should*," Rep. O'Hara declared. Jim Harrison, an O'Hara aide, explained, "We object to the decision to break down the tax data by zip in the first place. It is certainly not necessary.

"The IRS is doing something at taxpayers expense for junk mail advertisers. The tax return is not for the benefit of some bloody junk mailer."

Despite the fact that most of the orders for the data have come from bulk mailers, the IRS denies that this is the purpose of the project.

Internal Revenue Commissioner Randolph W. Thrower said that the breakdown was done because "these statistics are valuable to the IRS in tax administration and also to planning and research groups at federal, state and local levels."

Once the statistics were compiled, Thrower explained, the Freedom of Information Act would prevent their exclusive use by government and their being withheld from business organizations.

Army Buys Data

In addition to the commercial organizations ordering sets of tapes, six government agencies have placed orders. They include the Port of New York Authority and the Department of the Army, Office of Civil Defense.

The tax data is broken down into three income groups: less than $3,000, $3,000 to $10,000, and over $10,000. For each of the 35,000 five digit zip code areas and each of the three income groups, data is provided on the number of returns filed, the number of exemptions (an indicator of the number of children), the number of joint returns (housewives), and the total tax paid.

Taxpayers names and addresses are not included, and individual taxpayers cannot be identified.

For those who do not want to pay $2,000, the IRS is selling for $1 a booklet that gives a similar breakdown for the first three digits of the five digit zip code. Over 8,000 of these booklets have been sold since they went on sale this summer.

Previously, this information was available from the IRS only for entire states and for the 100 largest metropolitan areas. Smaller breakdowns were not available.

The tapes and booklets now being sold cover income from 1966, as filed with the IRS in early 1967.

Although the IRS has no immediate plans to do breakdowns smaller than by zip code, the census bureau is coming to the rescue of salesmen who need more detailed information.

By late this year they will begin selling, at $60 per reel, population characteristics and housing data broken down by the 300,000 Census Enumeration Districts (about 700 people each). By next year, they hope to have this broken down by city block.

Gallagher Proposes New Control on Mail Lists

WASHINGTON, D.C. – Death is probably the only thing that will stop a person from getting junk mail.

For those who want a less radical solution to the problem, there may be hope. Rep. Cornelius E. Gallagher (D-N.J.) has filed a bill (HR 15309) which would allow people to get off of mailing lists.

The bill would require the Postmaster General to keep a list of people who ask not to be on any mailing list. List brokers and mailing list users would be required to comply with this request.

In addition, the bill would require that every mailing contain the name and address of the source of the list, and that the source of the list would have to remove a person from the list if he so requested.

"Using the computer, it is now possible to create an incredibly sophisticated confluence of personal attributes and habits. Virtually any human activity can be the source of a list, and can have your name permanently embedded in someone's money-making computer," Gallagher charged.

"Even if the individual chooses not to receive direct mailings, his name is now added to a list," Gallagher continued. "If you have declined a piece of direct mail or have indicated displeasure with a specific mailing, your name is added to a 'sore-head' list.

"The people so labeled are prime recipients for solicitations offering animal repellents, burglar alarms, and bomb shelters."

Finally, Gallagher noted that the age of the computer which has caused the burgeoning of mailing lists may also make it easier to get off of lists.

"Since the vast majority of these lists are computerized, we can use the ease of entering and altering data in the computer to protect the privacy of our citizens rather than to invade it," he declared.

Copyright Bill Is Revised

WASHINGTON, D.C. – The Senate Subcommittee on Patents, Trademarks and Copyrights headed by Sen. John L. McClellan (D-Ark.) has acted on a revamped copyright revision bill (S. 543), but passage of the measure still remains in doubt after more than three years in the congressional mill.

The act, which would update copyright law for the first time since 1909, is now before the full Senate Judiciary Committee.

The major computer-related change in the new act concerns the proposed National Commission on New Technological Uses of Copyrighted Works.

Under the revised measure, the proposed commission will be solely set up to deal with the problems caused by the use of copyrighted material in computer and other automatic data processing systems, and will not have to deal with the problems caused by machine reproduction by such methods as Xerography.

In addition, the membership of the commission has been reduced from 23 to 14 by the new act.

The new commission would be made up of 13 voting members with four being selected from copyright owners; four from users of copyrighted material; four non-governmental members; the Librarian of Congress, and one non-voting member.

Members of Congress were to make up the additional membership in the original bill, but drafters of the new measure felt that Representatives and Senators would probably be too busy to attend the commission meetings and dropped them from the revised lineup.

Even with the changes in the new bill, staffers at the office of the Registrar of Copyrights feel that there will be no copyright revision this session of the Congress.

As in the past, they feel that the powerful forces presently embroiled over the use of copyright material in Community Antenna Television systems will foil any attempts to pass a bill.

E. Germany's Citizens Assigned EDP Numbers

BERLIN – Computer numbers are being assigned to all East Germans to simplify personnel administration and permit greater use of computers.

The East German press office announced that the numbers will be entered on the identity cards all East Germans are required to carry.

Power Source

Dataguard Protects Against Power Failure

dp accessories

SAN FRANCISCO – A recently developed unit is said to provide a solution to the problem of electric power failures and variations that are of concern to computer users.

The product, available from Computer Energy Corp., is said to produce up to 120 KVA of precise-frequency uninterrupted power. Designated Dataguard, the unit is said to eliminate voltage spikes and slumps and line-frequency variations.

In case of total power failure, Dataguard is said to provide enough power to operate a computer for from 2-1/2 to 30 minutes depending on the size of the battery bank used.

All solid-state, Dataguard comprises a rectifier section, a nickel-cadmium battery bank and an inverter. Because the batteries are the actual inverter power source, voltage and frequency anomalies are never seen by the computer.

An optional deisel generator is available if operation for more than 30 minutes during a complete power failure is desired.

The cost depends on the amount of power required. The Dataguard 60, for instance, which will power an IBM 360/65, would lease for $1,675 per month or can be purchased for $74,400. Smaller systems might cost as little as $31,500 or lease for $710 per month, the company claims.

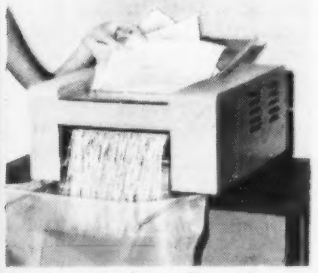
Computer Energy Corp. is located at 1255 Post St.

Shredders Eliminate Documents

FREEPORT, N.Y. – Two paper shredders have been made available from Shredmaster Corp.

One model – the Jet-1232 – destroys up to 150 pounds of paper per hour into unreadable shreds 1/32 of an inch in width, the company says.

The contents fall into polyethylene bags that are supplied with the machine. This shredder,



Jet-1232 Paper Shredder

available on a seven-day delivery schedule for $595, can destroy layouts, plans, bids, designs, IBM cards, blueprints, printouts, ledger sheets and plastic cards, according to the company.

The Bantam-10 model destroys up to 300 pounds of paper per hour into 1/4 inch shreds.

The Bantam-10 is priced at $280, and delivery is from stock.

Shredmaster Corp. is located at 891 S. Ocean Ave.

MT/ST Offered To Suppress Machine Noise

PASADENA, Calif. – A device for office machine noise suppression is being offered from Van San Associates.

The latest model in the sound-off dampener series is designed for the IBM magnetic tape Selectric typewriter and is designated MT/ST.

The MT/ST model is said to reduce operating noise levels allowing the use of this unit in even the most crowded location.

Normal machine use is not hampered with the sound dampener as provision has been made for external platen knob operation, slotted rear paper feed-through, and a receiving unit for the copy-holder, according to the company.

The unit is finished to match the original IBM equipment and is unconditionally guaranteed, according to the company. The model MT/ST is priced at $149.50.

Van San Associates is located at 32 S. San Gabriel Blvd.

MCI Proposes Low-Cost College Data Network

By Peter F. Carr
CW Staff Writer

WASHINGTON, D.C. – Microwave Communications Inc. has proposed to the Federal Communications Commission the establishment of a low-cost educational data communications network which would utilize facilities of the national MCI microwave transmission network together with existing CATV microwave links to interconnect colleges and universities.

The proposal recommends an educational communications link-up between colleges and universities to tie together their various computer, library and research resources. Among the institutions interested in the proposal are the University of Illinois, University of California at Berkeley, University of Michigan, University of New Hampshire, and Educom, an association of 100 universities which coordinates usage of university resources.

Although the proposed educational network would carry radio and TV transmissions, the interconnection of computers opens broad opportunities for colleges to share aspects of computerized research projects, thus avoiding duplication of effort.

Communications

In addition, the interconnection of data banks and library resources between educational institutions opens up vast stores of knowledge that could be accessed via data communications terminals by students, educators, and researchers.

In announcing details of the proposed educational network, MCI revealed the scope of the national data communications network which it is establishing.

According to William McGowan, chairman of Microwave Communications of America (Mi-Com), the MCI network will include 16 regional communications networks to reach over 11,000 miles through 40 states. Each of the interconnecting microwave systems will operate as an independent supplier of customized microwave channels on a common carrier basis.

"We are proceeding with construction of the route between Chicago and St. Louis," McGowan said. "Five other systems – New York-Boston, New York-Washington, New York-Chicago, Chicago-Minneapolis, and San Diego-Seattle – have applied for FCC licenses. Applications for the remaining ten systems will be made within the next six months," he said.

With FCC approval, the full network will be operable within three to four years, according to McGowan.

John D. Goeken, president of Microwave Communications Inc., which is installing the system between St. Louis and Chicago, said that the network will offer 72 basic microwave channels of different capacities.

These channels can be used in 10,000 combinations to meet the exact transmission needs of computer customers, he said.

The basic microwave system consists of two or more terminals which transmit signals and a series of towers in between, located from 25 to 100 miles apart, to carry the data signals over the earth's curvature, Goeken explained.

Since each regional system is designed to provide local service to customers, subscribers can connect to the system at any relay station with whatever equipment they choose. Up to five customers can share a channel, he continued.

Goeken emphasized the growing need for a communications system to match the growth in the computer industry. Computer utilities and time-sharing companies particularly are faced with long delays in securing lines and diminishing quality of service; the volume of data being transmitted is having an adverse effect on the public telephone system, he said.

Stating that the present system was designed basically for voice transmission, Goeken said that both low-speed and high-speed data must be transmitted over the same type of circuit which is often subject to noise from telephone switching equipment that can cause a significant error rate.

Approximately 80% of all data transmission now takes place over the direct distance dialing system, he said. Because of the longer holding times involved, the inflexibilities and restrictions in present private line services, and their voice-oriented design, the transmission cost to data users is substantially greater than it would be on facilities specifically designed for carrying data.

The MCI channels, Goeken continued, will offer high quality service at all data speeds. Data users will be offered rates based on the actual amount of data transmitted, as well as on a full-time, part-time, or channel-sharing basis, Goeken said.

"The service will save subscribers from 20% to 80% of charges being made for present services," he said. "Rates will begin as low as five cents per mile per month, with no restrictions on how channel bandwidths are used. These lower rates will make it possible for small communications users to afford their own private communications systems," Goeken said.

Center Diagnoses Communication Problems

By Ronald A. Frank
CW Communications Editor

RALEIGH, N.C. – A communications test center that allows customer engineers (CE) to diagnose teleprocessing malfunctions in most terminals and control units has been established by IBM.

The teleprocessing test center was developed by the IBM Field Engineering Division as a diagnostic aid to provide maximum computer availability for the data communications customer, according to a company spokesman.

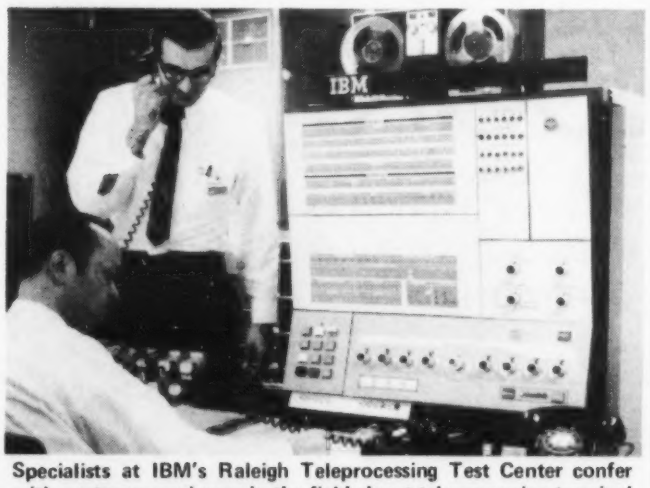
In a typical test operation, an IBM CE dials the test center using a Bell data set at the user's terminal. When the center's modified 360/30 central processing unit accepts the call, the CE requests a systems test at the customer terminal.

As soon as the connection is made, a general test of the equipment is automatically initiated by the test center. The CE may further request specific tests tailored to his particular problem. If an error is detected while operating the terminal, the CE is advised of the problem, and he can depress the "talk" key on the data set for verbal assistance.

In addition, the test center can supply diagnostic aids to monitor the transmit or receive side of a data line, systems problem analysis, and relative line-level readings; the center also has the capability to recognize problems from the transmitted audible tones. Test center specialists can detect the presence or absence of needed features, as well as strapping options (the data set configuration for a particular application), an example of which is an incorrect echo clamp delay.

The test center supports STR (Synchronous Transmit Receive), Start/Stop, and Bisync (BInary SYNChronous) devices. This includes telecommuncation terminals such as the IBM 1050, 2740, and 2741. Multiplexers such as the 2701, 2702, and 2703, and Bisync devices such as the 2780, are also supported. Communication adapters such as used on the IBM Systems 1130 and 1800, and the 360/20 can also be tested.

The test center receives calls from all parts of the continental U.S. and is capable of handling incoming data from several locations simultaneously.



Specialists at IBM's Raleigh Teleprocessing Test Center confer with customer engineers in the field about teleprocessing terminal testing.

Low Cost Magnetic Tape System Added to GE -115 Product Line

PHOENIX – GE-115 computer system users now have available a low-cost magnetic tape subsystem, the MTS110.

The new system is compatible with most IBM 729 and 7330 drives as well as the GE 400 Series and is said by GE to be intended for first-time users of magnetic tape processing.

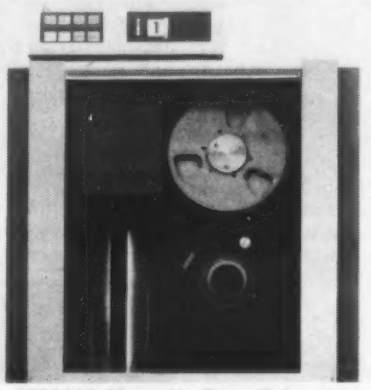
A single channel controller and up to four tape handlers can be attached to a GE-115. GE states that a high degree of reliability and minimum tape wear is provided by use of a single capstan drive in the handlers.

The MTS110 has a seven-track recording density of 200 or 556 char/in. Maximum transfer rate is 10.4K char/sec, read/write tape speed is 18.75 in./sec, with a rewind speed of 300 in./sec.

Forward and reverse reading is possible in continuous or start/stop mode. Writing is forward only in both modes. Parity checking is performed on read and write operations.

Cost of the basic subsystem, including controller and one tape handler, is $500 per month, with a $20,880 sales tag. Monthly rental for each additional tape handler is $215. Sale price per unit is $8,450. It is available on six-months delivery.

COMPUTERWORLD
systems/peripherals



MTS110 Magnetic Tape Subsystem

Local Processor Designed For Time-Shared Terminal

CAMPBELL, Calif. – A local processor providing an interface or link between a time-shared terminal and test equipment or a process control installation is available from Pacific Radionics Inc.

Designated the LP-1000, the unit is specifically adapted to commercial time-sharing services such as those offered by GE and Tymshare.

With the LP-1000, instruments such as programmable power supplies, voltage tunable oscillators, sweepers, oscilloscopes, digital volt meters, X-Y plotters can be controlled directly, providing on-line real-time data acquisition, command, and computations by a remote central processor, according to the company.

Option cards are available to provide up to eight full digital channels, sixteen controlled multiplexed analog inputs per channel or inputs for any number of serialized data test points. Other standard options include D/A, A/D converters, multiplexers, clock and interface adaptions to interconnect with various computers.

The unit is claimed by the company to be ideally suited for operations requiring large memory or computation beyond the capability of a minicomputer.

Basic software subroutines to operate the LP-1000 will be made available to customers, the firm said.

Prices for the LP-1000 start at $4,850 for the basic frame. Current deliveries are 30 to 45 days.

Pacific Radionics Inc. is located at 581 Division St.

LP-1000 Local Processor

Read-Only Memory

Intel Corp., Mountain View, Calif., has a bipolar LSI memory. Designated the Intel Model 3301, the Schottky-process bipolar read-only memory stores 1,024 bits in a 256 x 4 organization.

The unit is fully-decoded and provides random access in a maximum of 60 nanoseconds, according to the company.

The price per unit (for up to 9 units) for standard memories is $120. The price decreases with quantity ordered.

Con Comp I System Time Shares Jobs for Clinical Pathology Labs

HAUPPAUGE, N.Y. – A minicomputer system with time-sharing capability has been introduced by Com-Comp Inc. for use in clinical pathology laboratories.

The Com Comp I, built to Com-Comp specifications by Micro Systems Inc., contains an expandable 12K memory which features a 220-nanosecond access time. The unit, which comes supplied with special purpose software, is said to be the first of a series.

The Com Comp I can handle up to eight fully simultaneous terminals in the 12K configuration, and the firm claims that the 32K version can handle up to 100 terminals. The typical 12K configuration with four terminals and interfaces for four automatic laboratory devices will sell for under $100,000 and lease for under $3,000 per month on a full service basis, a Com-Comp official said.

The initial unit in the planned family can be equipped with a disk memory with a capacity up to 2.1 million bits. Future units will be able to handle two specially designed tape units, each with a capacity of 30 million bits. A standard teletypewriter keyboard is used for input/output control, and the firm has designed a keyboard accessory unit permitting printout of desired information in up to seven categories.

Software to handle up to 90% of the usual workload of a clinical laboratory is supplied with the system, and additional special purpose programs will be tailored to meet customer requests, the firm said. The software, while not hardwired, will be locked into the system, and Com-Comp will have to do all modifications.

While the first unit is aimed at the clinical laboratory market, the firm said that future systems would be developed for such applications as inventory control and the stock market.

Com-Comp Inc. is located at 1324 Motor Parkway here.

Com Comp I Minicomputer System

Systems/ Peripherals

Recorder Offers A Wide Range of Read/Write Rates

AUSTIN, Texas – A tape recorder which writes incrementally at 1,000 characters per second, or reads and writes synchronously from four to 37-1/2 inches per second, is being offered from Tracor Computing Corp.

The company believes the device, called the TCC 1701, will appeal to users who want a variety of write/read rates.

The TCC 1701 is set to generate coded information in seven- or nine-channel format, with densities of 556 and 800 bit/in. The device records incrementally in any eight-bit digital code entered from an interface unit, and has performed accurately when tested on the vacuum-type tape drives used on many computers, the company claims.

In addition to variable speed and tape density options, the TCC 1701 can be equipped with parity checking, read-after-write, echo checking, and cyclic redundancy check.

The unit mounts in standard 19-inch racks, and takes 8-1/2-inch tape reels.

Price ranges from around $6,400 for a 1701 unit with full checking options to $4,250 for quantities of a hundred. Deliveries are on a thirty-day basis, the company reports.

Tracor Computing Corp. is located at 1705 Guadalupe.

Voice Response Unit Connects to 1130 Channel

Systems / Peripherals

HUDSON, Mass. – Touch-Tone input and voice response are now available to the IBM 1130 user with an inexpensive unit made by Datatrol Inc.

The CI-114 voice response unit, according to Robert L. Fronk, president of Datatrol, can add an inexpensive and flexible communications system to the IBM 1130, thus extending its capabilities beyond batch processing.

According to Datatrol, any Touch-Tone telephone (or rotary dial telephone with a Touch-Tone pad) can be connected directly to the 1130's SAC (Storage Access Channel) or SAC II channel via the CI-114.

A user can call in, identify himself, and enter data using the Touch-Tone buttons. The computer, through a vocabulary of the response unit, responds to the user in spoken words to send information, request further data, or to confirm the data received.

Datatrol claims that the proprietary software provided allows the user to write applications programs using the voice response unit as easily as other input/output devices.

CI-114 Voice Response Unit

Available on a six-month delivery schedule, the basic CI-114, which has a vocabulary of 31 words and a single channel telephone capability, sells for $8,200 including software. On a third-party lease, the unit costs $190 per month, the company said.

Optional equipment available for the CI-114 includes a controller for a Bell 801 automatic calling unit, a multiplexer, a real-time clock, and a local speaker.

In addition to the basic 31-word vocabulary, 63, 93, or 189 words or combinations of words and phrases are available for the audio device.

Datatrol Inc. is located on Kane Industrial Drive here.

Line Printers Designed for Card Lists

WILMINGTON, Mass. – Two typographic peripheral line printers have been designed to produce output incorporating printing standards to which the human being is accustomed, according to Ted Magida, general manager of Photon Inc., manufacturer of the printers.

The printers are "applicable where the output of a data processing run must be read by 50 or more people," continued Magida. Possible applications include directories, cards lists, actuarial tables, premium rate books, and financial reports.

The 7700 model printer is an off-line tape-driven system with an output of 300 lines per minute. The 7700 can mix two sizes of any two type font designs at the same time. Software in Fortran is provided in the purchase price of less than $70,000 for the 7700, and the lease price of less than $1,500 per month.

The 7445 model printer is a remote printer driven by paper tape. It is an off-line/on-line system having up to four different type faces in four sizes from six to 18 point. The system operates on-line at a rate of 30 char/sec, and off-line at 17 char/sec. Purchase price for the 7445 is $11,000.

Both models have upper and lower case characters and punctuation marks.

The typographic peripheral line printers have been tested for three years and will be ready for delivery in the first half of 1970, according to the company.

Photon Inc. is located at 355 Middlesex Ave.

Performance is our product.

Graham tape is a means to an end.

We figured it out. Computer people don't really care about tape; they care about performance.

So that's what we sell.

Performance.

Performance that has set a new standard for the industry.

Strong talk? We've got the tape to back it up.

We've got the world's first million-pass tape — tape that's exceeded one million passes on CDC 680 certifiers, with no permanent errors.

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Tape so superb that every reel — repeat, every reel — is certified absolutely free of errors when delivered to you.

In short, we've got a tape that performs.

If you're tired of just buying tape, order a hundred reels of performance for a change.

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Dynaprobe/Dynapar Measures Data Throughput

ROCKVILLE, Md. – Comress Inc. has developed a package combining hardware and software technology to obtain precise throughput profiles of computers and programs in operation.

Dynaprobe, a solid-state portable device, consists of three logical elements: probe lines to convey statistical data input from the computer being monitored, accumulators to temporarily store count or timing signals, and a computer-compatible tape transport to record system performance data for later analysis.

The computer and software performance statistics accumulated during program execution can identify all relevant systems activities to enable a user to optimize systems throughput, according to the company.

Dynapar, the software product, performs a software analysis of the systems performance data that is accumulated.

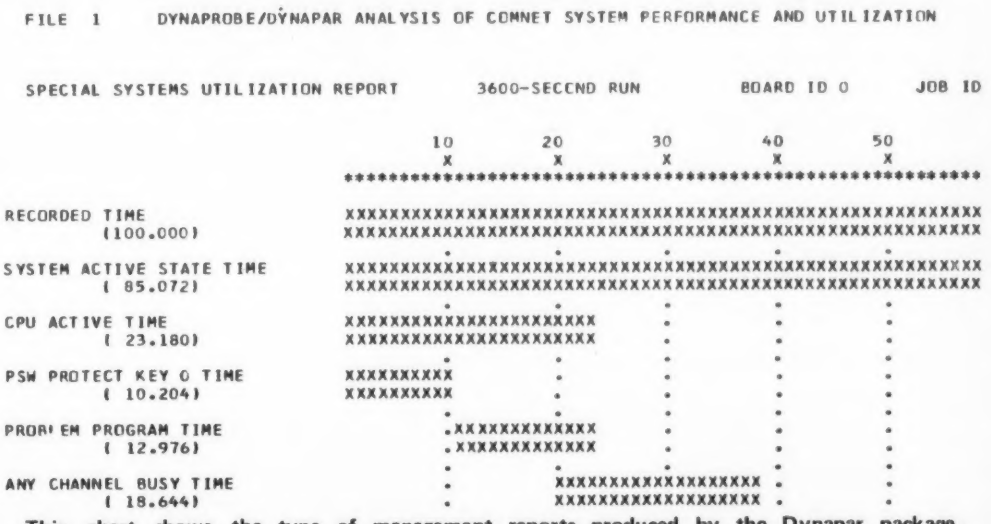
Management reports produced include precise measurements of central processor and peripheral equipment utilization, and operating system overhead directly related to individual application program execution. From this data, system performance profiles are generated for management review and evaluation.

Dynapar runs on the IBM 360 Models 40 and up and requires 64K of core memory. A company spokesman reported that the system will be available for other manufacturers' machines later. The monitor connects to most standard computers, the company claims.

The purchase price of Dynaprobe/Dynapar, a package including software, installation, and consulting support from Comress, is $35,000.

Leasing agreements are available for existing customers and new clients on a monthly, yearly, or one-week study basis. Training courses for client personnel will be provided monthly as a part of normal field support activities, the firm says.

The training activities are conducted at Comress headquarters, Two Research Court.



This chart shows the type of management reports produced by the Dynapar package. The output, produced in a preselected order, indicates the percentages of machine resources used by a particular segment of the hardware during program monitoring.

'Pat' Satisfies 100K Requests in Two Hours

BOSTON – Pat, a new proof and transit system for medium-size banks, has been introduced by Cullinane Corp.

The program can currently process some 100,000 items of daily business in under two hours of processing on a 360/30 (28K partition), according to the company.

The system uses a standard print-chain and an easily maintainable sort- and float-pattern table, the company says.

Developed by the Second National Bank of New Haven, Conn., the package can capture cash letter data for all end points, in addition to batch proof and deposit data.

Rerun passes require only 15K of core, and are used only for document separation. All data capture is done in the first pass, the company says.

Data is captured on disk files for later use with DDA, installment loan, and other banking systems. The program also accumulates float data and deposit items for service charge accounting, writes master and batch proof lists with details for each sort pocket, and automatically writes cash letters.

An audit trail for all stages of processing is provided, the company says. Cash availability can be improved by assigning priority values to specific types of transactions, such as deposits, and sorting in that pattern, according to Cullinane.

Safe Restart

The system can be stopped at any time, without any loss of data or records, permitting a simple restart, according to the developer.

This greatly facilitates the use of the system with multiprogramming, and allows the work to be processed on a purely demand basis, the company says.

The price of $15,000 is said to include complete documentation, installation, modification where necessary, maintenance, and training.

The firm is located at 60 State St.

360 Program Computes Production Schedule

WHITE PLAINS, N.Y. – A program that can serve as a master scheduler for a manufacturing plant has been announced by IBM.

The program, System/360 Capacity Planning, is the latest major module of IBM's Production Information and Control System (Pics), which includes bill of material processor, inventory control and requirements planning.

According to IBM, production managers can use Capacity Planning to help answer questions such as:

- "Can we expect our orders to be completed on time?"
- "Do we need additional facilities and resources?"
- "Should we plan for subcontracting?"

Linked with the other programs in Pics, Capacity Planning balances production requirements against available resources such as manpower, machines and materials. It then computes long-range production schedules for each work center in the plant.

One version of Capacity Planning, called infinite loading, assumes that the plant has unlimited resources. It produces reports that are said to be helpful in flagging potential bottlenecks in the manufacturing cycle. However, this version does not direct the computer to reschedule production to match available capacity.

A second version, called finite loading, takes into account the actual plant capacity as well as availability of materials. It then calculates schedules for each work center to solve potential overload and underload conditions. This can be done by adjusting order start dates, by scheduling overtime, or by some other method that plant management considers an acceptable solution.

Bill of material processor, inventory control and requirements planning, available from IBM before its separate pricing announcement of last June, remain available at no charge.

Capacity Planning infinite loading will be available under a license agreement at a monthly charge of $75. Finite loading will cost $225 a month, plus $25 a month for an interface program needed as a link to requirements planning.

The two versions and the interface, which run on a 360/25 or larger, are scheduled to be available in the third quarter of 1970, according to the company.

O/R Programs Soon to Be Available to Univac Users

PHILADELPHIA – Three operations research programs have recently been developed by the Univac Division, Sperry Rand Corp., to be available free of charge to Univac system users.

The packages consist of a linear programming system (LPS) for the Univac 9000 series; a mathematical programming system (MPS) designed for the Univac 494 system; and a functional mathematical programming system (FMPS) for the Univac 1106 and 1108 computers.

An operations research tool for small- to medium-scale users, the LPS package includes such features as bounded variables with multiple bound sets, bounds on rows, multiple objective functional rows, multiple right-hand sides, automatic inversion as required, and automatic output and product form of inverse algorithm.

LPS requires a minimum of 16K of core memory and will be available in June, 1970, according to a company spokesman.

The MPS is said to be an advanced system for solving linear programming problems on the Univac 494. Completely self-contained, the system includes its own monitor with the Omega operating system.

The Univac 494 MPS is comprised of matrix and report generation, an efficient optimization algorithm, a transportation algorithm, file maintenance and debugging aids, and offers maximum utilization of core size in relation to problem size. Input and output format options for compatibility with a variety of computers and systems are provided.

The MPS requires at least 65K of core memory and will be available in December, 1970, the company says.

The FMPS package is designed for large-scale users, and will be available in the summer of 1970. It requires 131K of core memory.

GMS Can Generate Cobol Programs for File Use

NEW CITY, N.Y. – Users can now generate Cobol programs for file maintenance and general-purpose file processing through the use of the general maintenance system from Information Science Inc.

Termed GMS, the system creates edit programs, update programs, file creation programs, and optional audit-trail or error routines.

The generated programs are in Cobol, for the 360, and allow the user to incorporate any specialized routines he might wish, the firm says.

Minimum machine configurations range upward from the 360/30 with 32K, and GMS will operate under either DOS or OS, according to the developer.

System features include: automatic audit-trail tapes; addition or deletion of records; arithmetic operations on any fields; creation of record or transaction counts; field edit validation; images of print or punch errors; and output on printer, punch, tape or disk, the company says.

GMS is currently operational, the firm says, and can be delivered within 30 days of contract agreement.

Priced at $5,000, the package includes documentation, installation, and personnel education.

Information Science Inc. is located in New City.

Prospro II Aids Process Control Engineers

WHITE PLAINS, N.Y. – An improved "fill-in-the-blanks" program to facilitate the preparing of direct digital control (DDC) instructions for process engineers is available from IBM.

The program – called Prospro II – is said to provide expanded supervisory control capabilities.

For example, it can update files as often as once a minute, according to IBM. Prospro II also directs the computer to monitor process variables that may call for initiating such actions as closing valves, altering another variable, or flashing an alarm signal to the operator.

Prospro II includes a DDC capability that provides second-by-second, on-line control of the instruments regulating an industrial process. The DDC capability, which is said to bypass individual controllers, could control 150 different instruments in a typical system, IBM claims.

The program can be used with the IBM 1800 data acquisition and control system to assist direct continuous industrial processes, according to IBM.

The second-by-second and minute-by-minute control levels can be implemented with the "fill-in-the-blanks" technique from the original Prospro/1800 program, introduced two years ago.

The technique allows an engineer to describe the industrial process and to develop a control scheme. IBM claims that little or no knowledge of programming is required.

The user fills in special forms specifying the frequency with which a process variable is to be read by the computer, its alarm limits, the alarm actions and control strategies. This information is then entered into the 1800 system using puched cards.

Prospro II will be available next February under a license agreement at a charge of $285 a month.

Sam Program Simulates S/360 Systems; Iam Helps Solve Complex Math Problems

PRINCETON, N.J. – Two new 360 programs, Sam (Systems Analysis Machine), and Iam (Interactive Algebraic Manipulation) are now available from Applied Data Research, Inc.

Sam

Sam is designed to simulate the operation of digital computers on a 360 with 128K or larger memory. It is available either as a package or on a service basis and will soon be available on the Digital Equipment PDP-10, the firm said. It may be available later on the Univac 1108, according to a company spokesman.

Scheduled to be available this month, Sam is said to be useful for software and hardware evaluation. New application programs can be estimated and costed with Sam, according to ADR.

The program is written in Fortran IV, but prices have not yet been announced.

Iam

Iam helps mathematicians, scientists, and researchers develop algebraic formulations necessary for the solution of complex mathematical problems.

ADR will be offering Iam through its PDP-10-based time-sharing system during the first quarter of this year, according to the company.

Iam is written in Fortran and supports interactive arithmetic, similar to Joss, Basic, or Cal.

Sample problems worked in Iam include Laplace transforms, solid state models, calculus of variations problems, and optimal control theory.

The company's offices are located here at the Route 206 Center.

Banks Use Installment Loan System

CHERRY HILL, N.J. – An installment loan accounting system from Arthur S. Kranzley and Co., developed at Wachovia Bank and Trust, is currently being offered to IBM 360 users.

Called Bankserv installment loan accounting system, the package provides for the following activities: variable payment schedule processing, variable input media, variable accrual methods, multibank processing, and variable due dates.

Written in Cobol for the 360/30 and up, and requiring at least 65K of core memory, the system is available on a 90-day delivery schedule.

The company has not yet announced the price although the first system will be delivered in the second quarter of 1970.

The Kranzley Co. is located here at 383 Kings Highway.

COMPUTERWORLD

education

360/65 Integrates Factors In School Balance Project

By Kate Rachstein
CW Education Editor

ORANGE COUNTY, Fla. – A model of the geographic and economic aspects of school desegregation, including travel costs, racial balance, plant utilization, classroom balance, teaching staff, and equipment, is being developed and tested as part of a computerized school census pilot project for area schools.

Administrators feel that desegregation, limited to the technical aspects of children, schools, distances, and staff, is suitable for computer analysis and cheaper than the human efforts involved in calculating the cost/time for each group of students to get to school; checking racial balance in each situation, given a certain enrollment zone; and searching for alternative solutions.

Cosponsored by the Florida State Department of Education, the Florida School Desegregation Consulting Center, and the Orange County School System, the project is being financed through a $125,000 grant from the U.S. Office of Education.

Broad Application

The goal of their combined efforts, according to a project summary, is the development of "suitable field-tested techniques that can be used by all types of school systems in their effort to achieve a unitary nonracial system."

Work began in September on the plan, which it is hoped will indicate the best school bus routings, the probable growth of school enrollment, and the most desirable sites for new school buildings.

An IBM 360/65 system is being used for the processing, with the main program written in 360 Assembler Language. A target date of early January was set for initial test runs.

During the next year, project planners hope to develop more complex systems to interface with the U.S. Department of Census' Dual Independent Map Encoding (Dime) file techniques. For the present, however, the Metro-Assignment Program (Map) will work principally by associating pupil information with a geocoding system.

How It Works

Input requirements for each student will include an identification number; an address, including a geographic identification code name; current grade and race; and other factors that may affect pupil assignment, including special education requirements, handicaps, vocational or technical studies, and special programs for secondary school.

This information will be matched with a tape record of the address ranges on each census block.

The result will be "spot maps" of student distribution. A plastic cover laid over the map will describe a network of main access roads. In this way, school administrators can obtain student counts from any specific zone by coordinates. This procedure can be carried out for each grade level to determine the most effective and economical means of achieving racial balance.

The project's computer consultant, Don Cook of Urban Data Processing, Cambridge, Mass., said that some difficulty is being encountered because "the school data doesn't have very good street address sources." Steps are being taken to correct this, he added.

Legislatures Next?

Peter Phlaum, director of the Institute for Policy Studies at Florida State University, where the project was announced recently, said it is hoped that a similar technique will be applicable in the future to aid plans for legislative reapportionment.

The funds were made available under Title IV of the Civil Rights Act and are administered through the Equal Education Opportunities Office of the Bureau of Elementary and Secondary Education.

Conference Proceedings Published By Digitronics Users Association

ALBERTSON, N.Y. – The Digitronics Users Association has published the proceedings of its fourth annual conference.

The volume includes transcripts of the seminars on The EDP Data Communications, Federal Regulations and Common Carriers; Serving the Remote Action Center in EDP Systems; Unbundling and Determining the Real Cost of the Bundle; and New Tariffs, Intercoupling and Interconnection.

Panelists included representatives of business and government.

Copies are available for $20 to nonmembers and $15 to members. Checks should be sent to the Secretary, Digitronics Users Association, P.O. Box 113, Albertson, N.Y. 11507.

Correction

The second chapter of Upsilon Pi Epsilon, an honor society for college students in data processing, was recently installed at Penn State University, not the University of Pennsylvania as reported in CW, Dec. 31-Jan. 7.

New Literature

A general-purpose alphanumeric display system, the Ultronic Videomaster 7000, is described in a four-page pamphlet. The system is said to cost less than $5,000 and to be IBM-compatible. More details may be obtained from the Marketing Manager, Ultronic Systems Corp., Mt. Laurel Industrial Park, P.O. Box 315, Morristown, N.J. 08057.

A bulletin (GEA-8870) on GE's Omnibus family of software packages for the GE-Pac 4020 computer has been issued. Individual bulletins also are available covering the GE direct digital control, the Biceps supervisory control, OPO optimization, and background processing with Freetime IV. Contact General Electric's Process Computer Dept., 2255 W. Desert Cove Road, Phoenix, Ariz. 85029.

Bulletin 10715M describes in two pages the mechanical characteristics and electrical specifications of the 7000 Series disk memory system manufactured by Information Data Systems, Inc. Copies may be obtained from the company at 8260 E. Eight Mile Road, Detroit, Mich. 48234.

The Computer/World of Universal Systems, Inc. **is a booklet relating Universal Systems' capabilities to programs in communications, transportation, and automation. The booklet stresses the company's orientation toward the development and marketing of turnkey systems for industrial and commercial applications. Contact Marketing Dept., Universal Systems, Inc., 2351 Research Blvd., Rockville, Md. 20850.**

An eight-page, three-color brochure, GEA-9011, describes GE's new inventory management system. The brochure illustrates and describes the ways in which GEIMS controls inventory and cites 12 important benefits resulting from its use. Copies may be obtained by writing to General Electric Information Systems, Bldg. 6-207, Schenectady, N.Y. 12305.

American Computer Technology's capabilities in the design and production of computer, digital test, and control systems and in the use of computer-programmed design are described in a booklet available from the company at 8740 Shirley Ave., Northridge, Calif. 91324.

Total service capabilities to the computer industry are described in a five-page brochure from Computer Congenerics Corp., Suite N-926, 2000 Classen Blvd., Oklahoma City, Okla. 73106.

Timeshare Devices, Inc. has issued a colorful six-page brochure giving details on its Model C/P 701 portable controller plotter. Output examples are included. Copies are available from the company at 225 Crescent St., Waltham, Mass. 02154.

An amusing color poster has been designed by Software Design Associates to protest the increasing complexity of problem solution. Free posters are available by writing Jay N. Goldberg, president, Software Design Associates, Inc., 40 Park Ave., New York, N.Y. 10016.

Information Supplies Corp.'s new brochure outlines a complete line of data processing supplies. ISC's entire line is described under three separate headings – data processing cards, data processing supplies, and magnetic tape and supplies. Contact Information Supplies Corp., 899 Skokie Blvd., Northbrook, Ill. 60062.

URS Data Sciences Co. has issued a brochure describing services available to computer users who are planning or undergoing a conversion from one computer system to another. The brochure is available by writing to URS Data Sciences Co., 1700 S. El Camino Real, San Mateo, Calif. 94402.

The features and advantages of the TTC-1000 concentrator are described in a brochure from Tel-Tech Corp., 9170 Brookville Road, Silver Spring, Md. 20910.

Advantages of the Westinghouse interactive time-sharing (Wits) computer services are described in bulletin DB 24-350, available from the company at P.O. Box 868, Pittsburgh, Pa. 15230.

Call for Papers

1970 IEEE REGION SIX CONFERENCE, May 26-28, Seattle, Wash.

The topic for the computer applications sessions of the conference is "Computer Aided Network Analysis."

Abstracts of 100 words should be addressed to the Technical Program Chairman, Dr. Peter R. Metz, University of Washington, Department of Electrical Engineering, Seattle, Wash. 98105, as soon as possible. Only papers not previously printed or published should be submitted. Complete papers must be received by March 1, 1969.

FIFTH ANNUAL ACM URBAN SYMPOSIUM Aug. 31, 1970, New York City.

The purpose of the symposium is to bring together interested professionals from the computing field and from the urban problem areas to provide a forum for the exchange of ideas, experiences, and information.

Papers are solicited covering computer applications and experiments in: urban information systems; urban planning; operations research; architecture; pollution; housing, transportation and welfare problems; education; and other areas germane to computing and urban problems.

Papers are also called for dealing with such critical problems as: is advanced computer technology being applied to urban problems? Is the technology useless in attacking the fundamental problems? and Have the efforts, in this area, of the past five years been misdirected?

Those planning to submit a paper should send a postcard giving the subject area and a very brief description, name, affiliation, business, and telephone number as soon as possible. Five copies of the entire paper must be submitted by April 15. All accepted papers will be published in the symposium proceedings. Authors will receive detailed instructions for preparing final papers; final copies will be required by June 30.

Address responses and requests to Paul R. DeCicco, ACM Urban Symposium Chairman, Polytechnic Institute of Brooklyn, 333 Jay St., New York, N.Y. 11201.

Calendar

Jan. 19-21, Chicago – A seminar on "Computer-based Accounts Receivable and Credit Monitoring Systems" presented by Seminars for Management Corp. Also in New York on Feb. 2-4. Contact: Seminars for Management Corp., 320 Fifth Avenue, New York, N.Y. 10001.

Jan. 19-23, Dallas – A course on Managing the Modern Accounting Department (1508-60) and in Chicago, a course entitled Computer-based Systems: Fundamentals of Planning and Design (6588-72) will be presented by the AMA. Contact: Course Registration, AMA Bldg., 135 W. 50th St., New York, N.Y. 10020.

Jan. 26-27, Los Angeles – A two-day seminar on The Simulation of Computer Systems with instructors Prof. Norman R. Nielsen and Dr. Thomas E. Bell, presented by Simulation Associates. Contact: Simulation Associates, Inc., 600 N. Broadway, White Plains, N.Y. 10603.

Jan. 26-30, New York – AMA courses on Financial Tools of Marketing (5524-17) and the Fundamentals of Information Retrieval System (6533-07), and in Chicago, a course in Advanced Marketing Research (5501-67). Contact: Course Registration, AMA Bldg., 135 W. 50th St., New York, N.Y. 10020.

N.C. Agencies Cooperate to Tackle State's Widening Programmer Gap

RALEIGH, N.C. – To combat stiff competition for programmers resulting from a recent influx of new industry, representatives of the state's computer facilities and its personnel, budget, and community college departments have established a program of cooperative education for training EDP personnel.

Designed to produce individuals with the skills and experience to qualify them as beginning business programmers in the state's many agencies, the project was begun in September, 1967, with 54 students.

They were enrolled in a 21-month program, which alternated between classroom instruction and on-the-job training at some eight-to-ten state agencies and one or two private firms.

High school graduates with some technical training were accepted for the program, with the state's budget division providing funds for payment of student salaries during their work periods.

Using the facilities of the nearby W.W. Holding Technical Institute, a curriculum was designed to give the students an understanding of the principles of business operation, techniques of handling business data, and application of EDP systems. They were also to receive programming experience in several business areas.

In addition to numerous business-oriented courses, the students received instruction in EDP mathematics, introduction to computer technology, numbering systems and Boolean algebra, programming applications, and programming projects.

Graduates of the course available for employment are now working at an average salary of over $7,000.

Gordon Fearing of the state's personnel department is well pleased with the program and hopes that it will soon be possible to coordinate it downward to the state's high school computer training and upward to its university-level projects.

Computer Assistance Pleases Publisher

BETHLEHEM, Pa. – The College Placement Annual, a listing of job availabilities for 1970 college graduates, has been prepared almost completely by computer for the first time, according to its publisher, the College Placement Council, Inc.

The current 696-page edition employed computer assistance for the printout of forms, the processing of cross-reference sections, the setting of type, and the composition of pages on film from which the printing plates were made.

Having completed the initial changeover, Editor Warren E. Kauffman commented, "We expect that the publication will now be produced even more accurately and economically, and with greater speed."

Education Briefs

Merc Seminar Series

LANCASTER, Pa. – A series of demonstration projects by the Middle Atlantic Educational and Research Center (Merc) has begun at Franklin and Marshall College, headquarters of the time-sharing utility geared to the needs of small educational, research, and governmental nonprofit agencies.

To date, two one-day presentations have been offered, one on the use of computers in language instruction, and the second on the computer and the physics laboratory.

A Franklin and Marshall spokesman said that the seminars had met with "terrific" success, and that future plans include similar seminars in a number of other disciplines.

Success Story

BURLINGTON, Mass. – A placement rate of 90% has been reported for graduates of the computer technology course of Control Data Institute (CDI) by Director Perry C. Smith.

More than 400 students are currently enrolled in the training program, which offers hands-on laboratory instruction in computer maintenance, operation, checkout, and installation. Basic electronics, programming languages, and computer logic are included.

Begun in December, 1968, the course consists of 1,000 hours of instruction. Students must be high school graduates and are screened through a battery of aptitude tests.

Cost of the course is $2,400.

North Carolina Network

RESEARCH TRIANGLE PARK, N.C. – The National Science Foundation (NSF) has announced 13 grants totaling $475,000 for the development of educational computer use at colleges throughout the state.

The largest segment of the award, $344,000, will go to the State Board of Higher Education for support of the North Carolina Educational Computing Service (NCECS), created last July to provide computing service to North Carolina educational institutions.

The NCECS network currently includes 34 public and private universities, junior and senior colleges, and one high school system.

Several additional schools, mostly community colleges and technical institutes, are expected to join the project within the next few months.

The total NSF award will be augmented by $1.3 million contributed to the project by the state.

Games in Fun City

NEW YORK – Have you figured out how to program squash or run up an impressive total in an electronic version of backgammon?

September's ACM 70 conference will feature a special computer sports event, and ACM officials are seeking suggestions of unusual and applicable computer games.

Conference planners will attempt to keep the selected contests under wraps in order to be as fair as possible to the computer/player, who might not have as much time to bone up as his human opponents.

Suggestions may be sent to Jules Garfunkel, ACM 70 Computer Sports, ACM Headquarters, 1133 Avenue of the Americas, New York, N.Y. 10036.

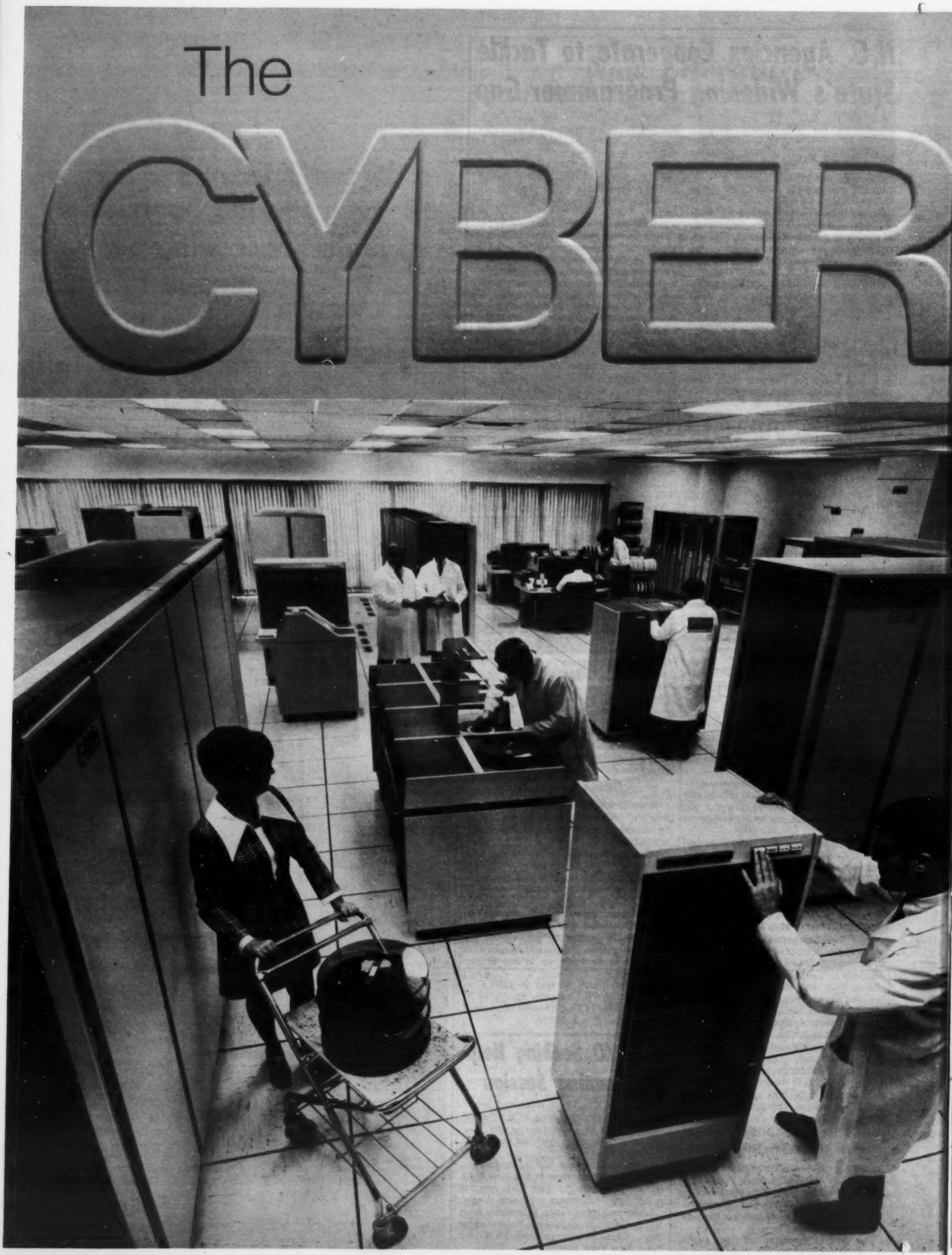
ACM 70 Seeking Help At Planning Session

NEW YORK – Those interested in participating in the upcoming ACM 70 show, "The Impact of Computers in the 70s," are invited to meet with its committee chairmen on Jan. 19.

A special reception will be held during the Compso East show at the New York Hilton (Jan. 19-21) from 6-8 p.m. in room 510. Volunteers are being sought.

Additional information is available from Myrna Gershenson, Systems Programming Dept., Chase Manhattan Bank, 59 Maiden Lane, New York 10015.

The CYBER



NET™ system

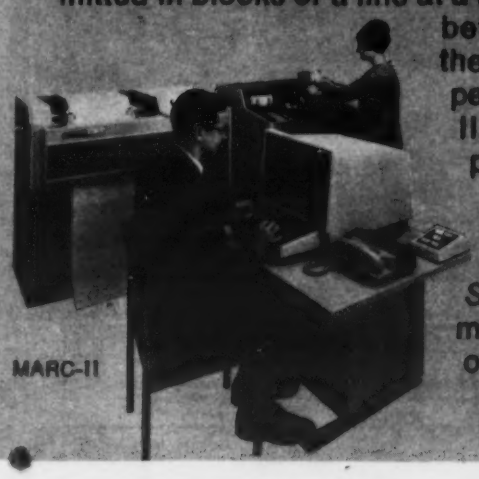
The main problem with having an efficient, economical terminal like the MARC-II is that you don't have an impressive mainframe to show visitors. And you probably wouldn't have the MARC-II in a special room either. Just another office.

Well, to avoid the problem of underestimating the MARC-II, we've outlined a briefing procedure for tours of this data processing facility.

STEP ONE — Point to the cable leading to the telephone outlet and state that at the other end of that cable (a millisecond away) is the world's most powerful computer complex — the CYBERNET System. Control Data's CYBERNET System is a network of computer centers located in 29 cities across the United States and worldwide. With CDC® 6600 and 3300 computer systems, these centers provide a perfect combination of computing power and high capacity data processing capability.

The tremendous speed of the CDC 6600 computer and its multiprocessing capability mean that, when you operate your MARC-II terminal, it's as if the total computer system at the center were dedicated to your particular problem. And that speed also means that problems that would take hours or days on other computers are solved in seconds or minutes with the 6600 supercomputer — a factor that means substantial savings in time and costs.

STEP TWO — Point out that the MARC-II, with its CYBERNET System tie-in, can handle any data processing problem that can be solved with a free-standing computer. It has both batch-job and interactive capabilities. The MARC-II has an entry keyboard, CRT display, 300 card-per-minute reader, and 300 line-per-minute printer. Data can be entered by the keyboard or card reader, edited on the display screen, and transmitted in blocks or a line at a time. Transmission speed between the terminal and the center is up to 300 bytes-per-second with the MARC-II, and up to 6000 bytes-per-second with other terminals in the MARC-Series and wideband communications.



MARC-II

STEP THREE—Be sure to mention that your choice of access to the CDC 6600 and the 3300 systems provides you with a one-two punch of computing power and high-capacity data processing for increased problem solving efficiency. Your cost per computation is lower *and* you pay only for the resources you use as you use them.

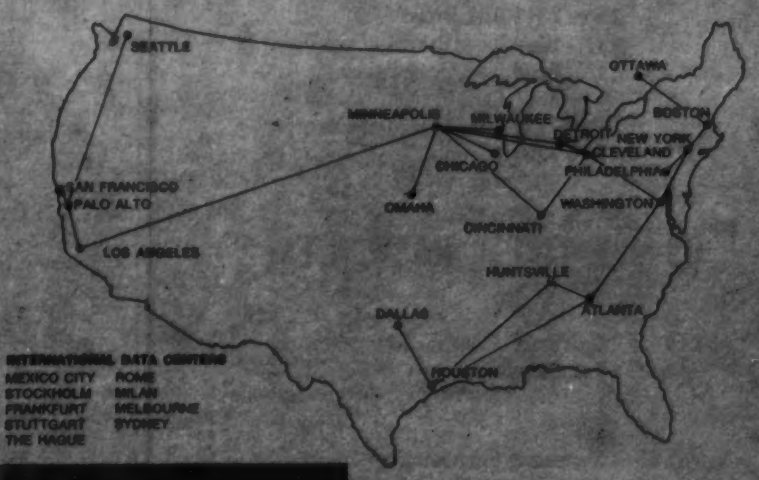
STEP FOUR—Stress the point that alternate centers throughout the CYBERNET System are always available to perform your processing. You are no longer dependent on a single facility where being "down" can seriously hamper your operation.

STEP FIVE—Note the fact that the MARC-II doesn't require air conditioning or a raised floor . . . that it uses a low-cost dial-up voice-grade phone line.

STEP SIX — Demonstrate how easy it is to search, change or update your files (which are stored at the CYBERNET Center) with CDC's new software system, SHADE. And how its companion system, SHADOW, provides you with the command and control features to designate which CYBERNET 6600 or 3300 (or combination of both) you want to use to solve your problem.

THAT'S THE BRIEFING. It's really *too* brief to tell you all the impressive things about the CYBERNET System and the MARC-Series of remote terminals from the MARC-I to the MARC-V.

Get the *full* briefing by calling your nearest CDC Data Center. Or contact us directly. You'll be impressed.



CONTROL DATA
CORPORATION

For further information, call or write:

In the United States:
Data Services Division
Dept. 213
Control Data Corporation
4550 West 77th Street
Minneapolis, Minnesota 55435
Phone: 612/920-8600, Ext. 5091

In Europe:
CDC Data Services, Dept. 213
Control Data GmbH
6 Frankfurt am Main 16
Niddastrasse 40
West Germany
Phone: 71-231

Telescope Data Analyzed to Explore Cosmos

FLAGSTAFF, Ariz. – Astronomers at the Lowell Observatory are using space-age computer techniques to answer centuries-old questions about the universe.

The observatory, best known for its discovery of the planet Pluto, uses an IBM 1130 system to help analyze data collected from seven specialized telescopes.

Staff astronomers seek answers to such questions as the size, mass and composition of specific stars, their distance from Earth and from one another, and their movements in space, as well as the topography and meteorology of the major planets.

"The product of the Lowell Observatory is research," said Dr. Otto Franz, staff astronomer. "The computer helps us do things we couldn't possibly achieve in any other way."

Franz's specialty is "double stars," those paired celestial bodies which revolve about their center of mass as do dancing partners.

"If these stars were visible to the naked eye, which of course they usually aren't, they'd appear as a single point of light," Franz explained. "Even the largest telescopes can't separate those within five seconds (1/720th degree) of one another well enough to permit accurate determinations of their brightnesses and colors.

"But with the newest scanning procedures and computer data reduction, we have obtained such observations for stars less than two seconds (1/1800th degree) apart."

Information gathered at the telescopes is electronically coded onto paper tape and sent to the 1130 in the planetary research center. The system reduces these seemingly unrelated numbers to tangible results.

"We hope eventually to set up a microwave link from the telescopes to the computer and install a display screen," said C.E. Laughead, data processing manager and senior programmer.

"This would allow us to display information as it is processed and give us the capability to analyze an eclipse, for instance, while it's actually happening."

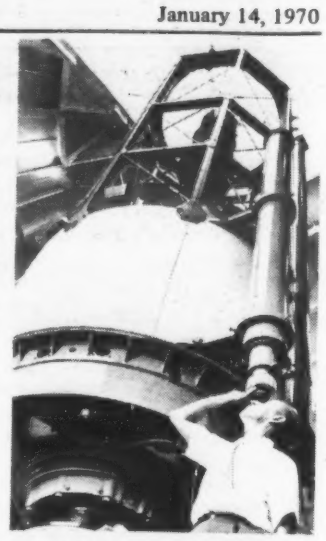
Before the recent Mariner fly-by missions, the computer had helped analyze some 10,000 photographic plates of Mars collected since 1900.

"Every plate was catalogued and analyzed with the aid of the computer," Laughead said. "It was a huge data reduction job, and the Mariner photographs later proved our information to be quite accurate."

The observatory was founded in 1894 by Dr. Percival Lowell, member of the renowned Lowell family of Boston. A brilliant astronomer, Lowell predicted the existence of an unknown planet and supervised the calculations of five people who worked seven years to establish its probable position.

In 1930, 16 years after his death, a specially built telescope helped astronomers detect the planet within 1° of the point Lowell had said it should be.

The observatory covers some 700 acres on a mesa a mile west of Flagstaff. The location is exceptionally favorable for astronomy because of its cloudless nights and its haze-free, 7,250-ft elevation.



Dr. Otto Franz uses an IBM computer to boil down information on stars millions of light-years from Earth collected from this specialized telescope.

Physician, Laboratory, Computer Combine To Diagnose Thyroid Diseases Instantly

GAINESVILLE, Fla. – A computer is helping physicians at the University of Florida's J. Hillis Miller Medical Center simplify the once difficult and time-consuming job of diagnosing thyroid disease.

Using information supplied by a patient, his doctor and a laboratory specialist, an IBM 360/50 can detect most thyroid conditions within minutes. These reports are then checked thoroughly by specialists, who have found them accurate in 95% of all cases.

Radiation physics instructor Lawrence T. Fitzgerald, who developed the computer program, said a similar essay report by a physician previously required hours, sometimes days, to be dictated, typed, and proofread.

"Formerly," Fitzgerald said, "it was not unusual for a patient to have been discharged by the time a physician's report became available, and the patient had to be recalled."

Health center personnel now use an IBM 2741 terminal and a telephone line to enter information on a suspected thyroid patient into the 360/50, located across campus at the university's computing center.

The data is processed in less than a second by the computer, which compares the patient's condition with known diagnostic findings on 2,000 thyroid cases. A complete report, listing diagnostic probabilities figured mathematically and a conclusion, is printed back on the terminal within two to three minutes.

When data is not sufficient for diagnosis, the computer suggests additional laboratory tests to increase the probability of obtaining a proper diagnosis while the patient is still in the hospital.

The thyroid diagnoses are made for the health center's own patients and for patients at a nearby Veterans Administration hospital.

Fitzgerald said the diagnoses are important because the thyroid, a small, butterfly-shaped gland straddling the Adam's apple, has a profound effect on the health and energy of the human body.

Essentially, the thyroid accumulates the body's scarce supply of iodine and synthesizes the substance into a hormone known as thyroxin.

An insufficient supply of the hormone, a condition known as hypothyroidism, causes the body's machinery to slow down. Symptoms may include low body temperature, weakness, fatigue, poor appetite and, sometimes, weight gain. Sluggishness or even stupor may result if the condition is untreated.

Commodities Exchange Adopts Quotation System

CHICAGO, Ill. – All contracts, including those in silver and plywood, which were recently added to the list of tradeable commodities, are being reported and recorded by a minicomputer-based price and quotation system at the Chicago Board of Trade, the world's largest commodities exchange, according to E. William Sevetson, board vice-president.

Called Com-Quote, the system, originally installed in 1966, is designed around two Digital Equipment Corp. PDP-8s. The system collects commodity quotations from the trading floor, displays current price data to brokers on the floor, and distributes quotations to brokers around the world.

"The system was designed to improve the accuracy and reliability of price reporting, the speed of price reporting, and provide rapid access to previous commodity prices," Sevetson said.

The 1,402 members trade by open auction in commodities such as wheat, oats, corn, rye, soybean meal, soybeans, soybean oil, iced broilers, steers and in the two newest non-farm commodities of plywood and silver.

Product auctions take place in "pits" bounded by three or four steps in which hundreds may be actively trading, depending upon the interest in a commodity, time of day, season of year, and many other factors.

Reporters, who each overlook a trading pit, are responsible for observing and recording prices from the shouts and hand signals used by the traders. Once the reporter gets the price, he records it on paper, and passes it to a transmitter. The transmitter enters quotations via a keyboard which is directly on-line to the PDP-8 computers.

The PDP-8s then check each quote as it is entered against previous quotations to test their validity. Acceptable quotes are retained for subsequent printout and for output to visual displays. "Adaption of the new system has significantly decreased the average time required to disseminate prices," noted Sevetson.

The system features an extra precaution to ensure maximum reliability. The second PDP-8 is always kept on stand-by alert and can be activated very quickly.

Analysis of Fire Causes Helps Florida Forest Service Reduce Number of Fires

TALLAHASSEE, Fla. – A computer is helping the Florida Forest Service reduce the number of fires in the state's 20 million acres of protected woodland.

According to H.K. Mikell, director of the agency's Fire Control Branch, an IBM 360/20 has made it possible to analyze fire causes in depth in a given area so that pinpoint preventative action can be taken.

In addition, the computer has identified the most effective fire towers and reflected a need to change manpower schedules.

Fire Control Areas

Reorganization already is under way affecting about 800 fire-fighting personnel in 56 fire control areas reporting to six district offices. Eighteen new districts will replace these and help provide balanced workloads for rangers.

"We are now shifting personnel and measuring field activity with our IBM system to guide us in staffing the needs of these new districts," Mikell said.

Computer-prepared data also may be used at some future date for decisions on the amount of equipment and personnel needed to fight fires occurring in specific locations under different weather conditions.

Analyses of fires are now prepared from detailed field reports processed by the computer, resulting in what Mikell calls a "narrative word picture" of details. Data includes variables such as the location of a fire, time of discovery, size, duration, cause, weather conditions and the types of timber or vegetation burned.

"This allows us to pinpoint any unusual fire conditions anywhere in the state," Mikell said. "It also means we are able to make more efficient use of our manpower and equipment."

Burn figures were high in 1968, with 7,342 reported fires which consumed 137,674 acres of protected timberland. However, many fires occurred during one of the worst spring droughts in Florida's history and 2,500 blazes were classified as deliberately set fires.

Computer-prepared data indicates that the average fire in 1968 was controlled or extinguished in less than an hour and burned less than 20 acres. The majority of burned timberland was destroyed by a few dozen large fires.

Computerized Concrete Mixer Precisely Measures Quantities of Gravel, Cement

OAKLAND, Calif. – A typewriter-size computer is helping concrete contractors get precisely the blend of sand, gravel, water, and cement that is required for construction jobs ranging from sidewalks and home foundations to prestressed concrete girders and high-rise apartment buildings.

The computer is the heart of the Mark II Selectron, a computerized batching control made by Advanced Electronic Controls, that can precisely measure and blend tons of various grades of sand and gravel with different types of cement, add the proper amount of water, and either mix the ingredients in a central location or load them on a concrete truck that can mix them on the way to the destination.

Concrete Formulas

The central processor for the Selectron system is a Digital Equipment Corp. PDP-8/S. The 75-lb computer can "memorize" as many as 100 formulas for concrete and mix them within tolerances set for each.

An operator at the Selectron console can enter a formula to be mixed through a teleprinter and have it recorded in the computer's memory. When the concrete is to be mixed, the operator types a code that tells the computer what amount of concrete should be mixed.

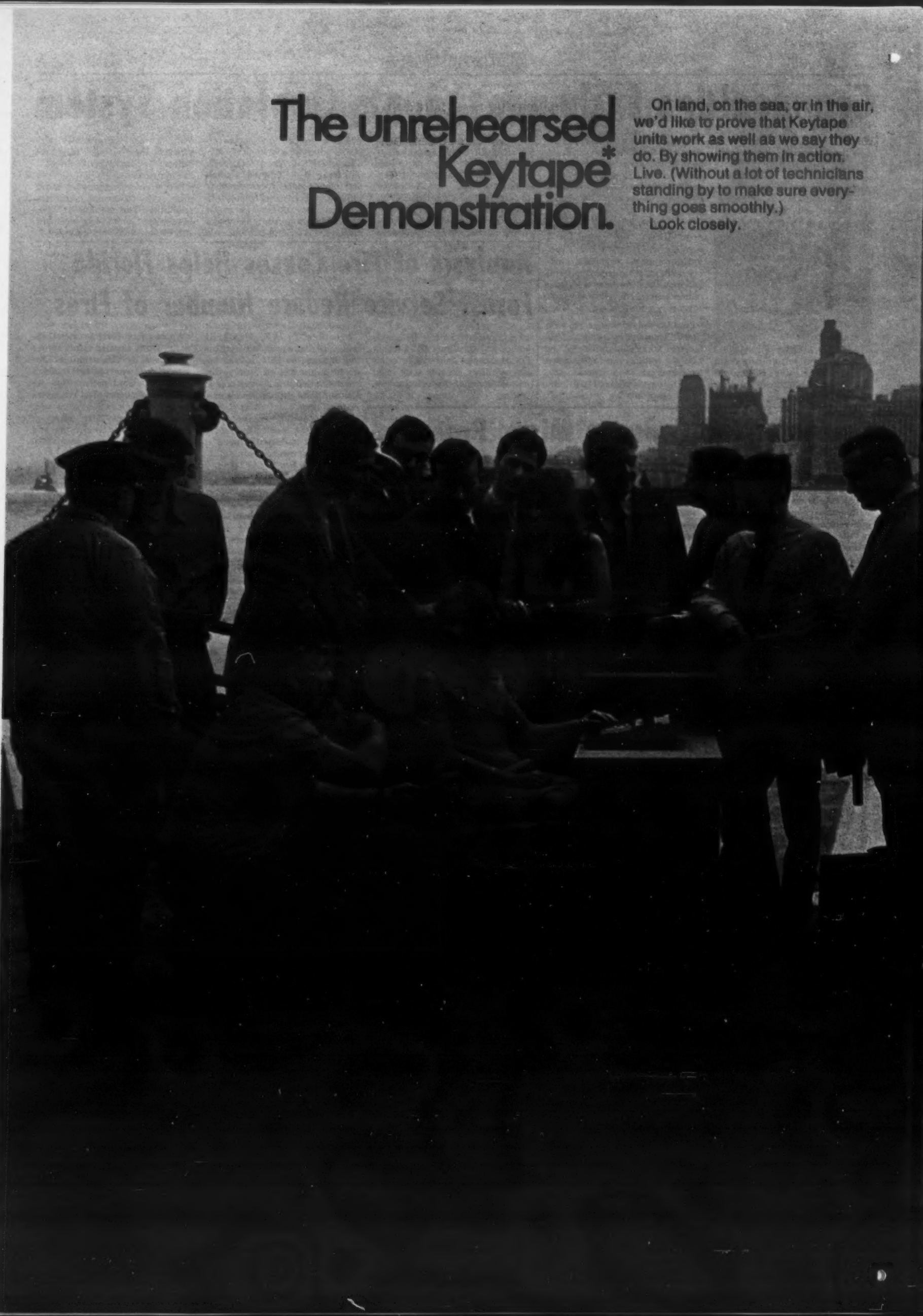
The computer controls the amount of each ingredient by monitoring scales that weigh the material. It also controls gates that allow the material to flow into the central mixer.

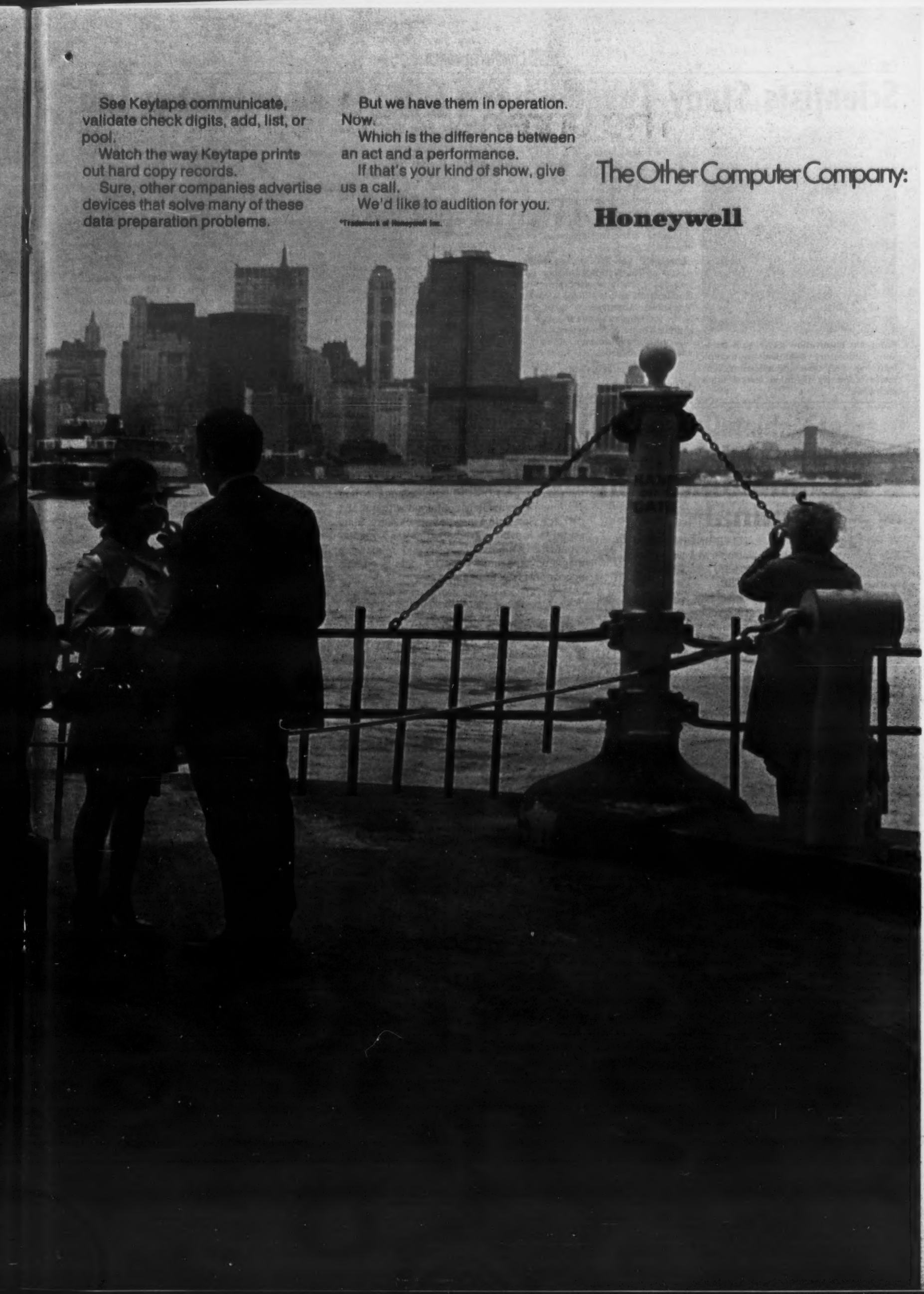
The operator can call for a printout of running totals of materials used during a specific period of time; he can determine the amount still on hand, and he can use the statistics to determine inventory, use of various formulas, and truck usage. The Mark II Selectron also can produce a paper tape listing all or part of the day's activities for input to data processing machines.

The unrehearsed Keytape* Demonstration.

On land, on the sea, or in the air, we'd like to prove that Keytape units work as well as we say they do. By showing them in action. Live. (Without a lot of technicians standing by to make sure everything goes smoothly.)

Look closely.




See Keytape communicate, validate check digits, add, list, or pool.
Watch the way Keytape prints out hard copy records.
Sure, other companies advertise devices that solve many of these data preparation problems.
But we have them in operation. Now.
Which is the difference between an act and a performance.
If that's your kind of show, give us a call.
We'd like to audition for you.
*Trademark of Honeywell Inc.
The Other Computer Company:
Honeywell

Scientists Study Thunderstorm Data in Mountaintop Lab

From this observation tower atop Langmuir Laboratory scientists photograph lightning and take its spectrum. The tower is hit by lightning several times each year.

LANGMUIR LABORATORY, N.M. – Scientists from throughout the world are participating in a study here to find out what causes thunderstorms and the associated lightning and rain.

Armed with rockets, airplanes, a laboratory in the sky and an IBM information processing system, these scientists seek to inspect the insides of thunderstorm clouds to learn the mysteries of their violence.

Langmuir Laboratory, supported primarily by the National Science Foundation, is literally a laboratory in the clouds. Built atop a 10,600-ft peak in the Magdalena Mountains west of Socorro, N.M., the laboratory site is unique in that thunderstorms occur almost daily during the summer and autumn, directly above and around the lab.

Remote Lab Site

The remote lab site is one of only a few places in the inhabited world where thunderstorms develop with a precise pattern of regularity.

Information on the towering cumulonimbus (thunderhead) clouds is obtained from numerous devices and fed into the IBM system, which assembles and organizes the information.

"The system automatically synchronizes our separate readings of many events that occur during the life of a storm cloud and translates the information into numbers that we can interpret," said Charles Holmes, a geophysicist involved with the IBM section of the project.

For example, he explained, in the brief course of a lightning bolt, the IBM system shows what all sensing devices recorded at the same instant of time.

Readings include temperature, pressure, water content, heat energy, electrical energy, thunder intensity and several other scientific measurements.

Thunderstorm Simulation

The information processing device, an IBM 360/44, also is used to simulate thunderstorms. "We actually will create a mathematical model of a thunderstorm inside the system and then conduct additional studies," Dr. Holmes explained.

Project scientists have numerous differing theories on what makes a thunderstorm tick. Each is able to test his theories at the laboratory.

Scientists gather information using a variety of devices and techniques. One specialist from the National Center for Atmospheric Research fires instrumented rockets into thunderheads to measure electrical fields inside the storms. The "warheads" of his rockets contain delicate, miniaturized electronic measuring devices and transmitters which broadcast the readings back for processing by the computer.

Computer Collects Formulas of Fiber; Deters Duplication

WINDSOR LOCKS, Conn. – A company here has such a broad product line that it uses a computer to make sure it doesn't develop the same product twice.

The C.H. Dexter Division of The Dexter Corp. makes hundreds of specialty nonwoven materials for an endless variety of applications ranging from teabags to radiation monitoring devices for nuclear submarines.

By feeding the requirements for the new product into a computer, an IBM 360/25, the company's researchers find out which of hundreds of previously developed formulas come close to filling the bill.

Product Uses

Ralph H. Martin, division president, says the division's products find uses in aerospace, disposables, food packaging and water and air purification and must meet rigid requirements.

"Even ordinary teabag filter paper is a complex blend of properties. It must have high wet strength, controlled porosity, high heat resistance as well as purity and neutral taste," Martin says.

Radiation Monitored

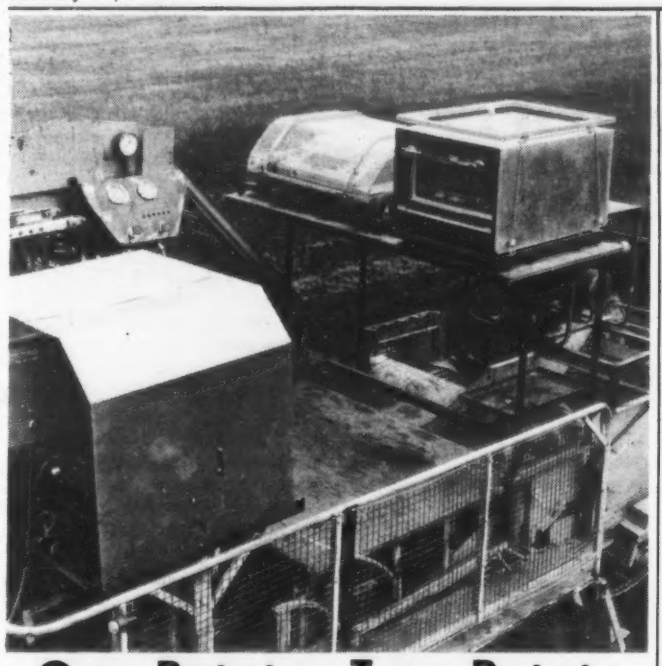
One company development, a special microglass fiber web, becomes part of air sampling devices which monitor radiation levels inside nuclear submarines.

Formulas also are stored in the computer for materials used in the manufacture of surgical masks, automotive filters, electrolytic capacitors, flashlight batteries, mimeograph stencils, disposable diapers and disposable surgical gowns and drapes and many other products.

With hundreds of formulas at their fingertips, researchers save time and avoid duplication of effort. Once the search is narrowed down to a few formulas, they can make the final selection.

BUSINESS **COMPUTERWORLD** INDUSTRY

January 14, 1970



One Potato, Two Potato

An unlikely place to install a DEC PDP-8 computer is on board a potato picker, but this is just what has been done by the National Institute of Agriculture Engineering, Edinburgh, Scotland. The potato picker is a preproduction model using X-ray techniques to reject all foreign matter from the crop.

The PDP-8 and its control typewriter travel with the machine and provide the basis of a logging and analysis system for evaluating machine performance. Despite the harsh environment, the machine is standing up to its task well and is soon to work an overnight shift, as an unattended data reduction station sorting out the details of the day's work.

Honeywell Forms Three Divisions For Growth in Computer Field

MINNEAPOLIS – Three more divisions have been formed by Honeywell, Inc. to speed the company's growth in the computer communications and data products fields.

The new divisions growing out of the firm's Communications and Data Products Division, are:

- The Data Systems Division, which will market, sell and install all Honeywell computer products to the U.S. government, and will design and develop specialized commercial systems. It will be based in Minneapolis.
- The Data Products Division designs and produces Keytape data-encoding devices and disk-pack data-storage devices, and markets computer printer ribbons and magnetic tape. The operation has grown from 300 employees in early 1968 to 1,300 today. Headquarters are in San Diego.
- The Tampa Division, which is high-volume producer of digital electronics equipment, plans to expand in commercial markets. Organized in 1965, the facility has expanded to 1,500 employees.

Named vice-president and general manager to head each division were: Dr. James J. Renier for Data Systems, W.R. Willmert for Data Products, and A.R. Perry for Tampa. Renier has been with Honeywell for 13 years, Willmert for 17 and Perry for 5 in key management positions.

The three new divisions, as do four others, will report to C.W. Spangle, vice-president and group executive, E.C. Lund, vice-president and associate group executive, of Honeywell's Computer and Communications Group.

Spangle said the growth and development of the three elements of the former Communications and Data Products Division had reached company goals set two years ago to win significant positions in the computer communications and data products market.

The Data Systems Division, Spangle said, will seek to increase Honeywell's penetration of the $1.9-billion-a-year Federal market through analysis, design and installation of total computer systems, including hardware, software, communications links and remote terminals.

The 450-man operation will consist of technical centers in Minneapolis and St. Petersburg, Fla., and a nationwide marketing organization. Engineering and manufacturing facilities of the company's Electronic Data Processing, Computer Control and Information Services Divisions, as well as those of Data Products and Tampa, will be utilized, he said.

CDC Goes Outside States To Give $4 Million Contract

LONDON, England – A $4 million contract, believed to be the largest software order ever placed outside the U.S. by an American company, has been awarded to SIA Ltd., London, and SIA Paris by Control Data Corp.

The contract calls for the development of new software for the CDC 6000 series computers, including a sophisticated time-sharing system and a linear programming package.

The developments will be carried out by joint Anglo-French teams working in London and Paris, and are scheduled for completion in 1972.

The largest part, the development of a time-sharing system for the CDC 6400, is to be jointly financed by SIA and Control Data.

SIA is to provide the software expertise and Control Data any computer time necessary. Total expenditure on the systems is expected to be $3 million.

SIA is also to develop a linear programming system for the CDC 7600, based on the Ophelie II system previously developed for their own CDC 6600s. The new system will be known as Ophelie III. Other contracts between the two organizations include the rights for Control Data to make Ophelie H available with the 6600.

SIA Ltd. and SIA Paris are members of SIA (Metra International), Europe's largest group of computing service and consultant organizations. Each operates a bureau service, based on a CDC 6600, which is to be augmented in 1970 by the addition of time-sharing services based on CDC 3300s.

SIA Paris is also to install a CDC 6400 as a front end processor to their 6600 during the coming year.

Metra International currently operates in the United Kingdom, France, Spain, Italy, Germany, Belgium and North Africa. New companies are currently being established to market the group's consultant and information services in North America.

RCA Information Systems Undergoes Realignment

CHERRY HILL, N.J. – A major realignment of the top management of RCA's Information Systems Group to meet the future needs of the company's growing computer activities here and abroad was announced recently by James R. Bradburn, RCA executive vice-president, information systems.

L. Edwin Donegan Jr., was named division vice-president and general manager of the newly-named Computer Systems Division, formerly called the Information Systems Division. Bradburn had been serving as general manager of the computer division in addition to his other duties.

Donegan, who for 18 years was an IBM executive and for the past year head of RCA's computer marketing operations, now will be responsible for the overall operation of RCA's computer division, including marketing, field engineering, systems programming, product engineering, manufacturing and administrative functions.

At the same time, Edwin S. McCollister was appointed division vice-president, marketing staff, with responsibility for the international marketing of RCA computers and for providing staff guidance to the marketing activities of all four divisions of Information Systems – Memory Products, Magnetic Products, Graphic Systems and Computer Systems. He formerly was division vice-president of marketing for the computer operation.

Commenting on the management changes, Bradburn said, "they come at a time when RCA is making substantial gains in the information systems market, particularly in the most profitable and rapidly growing segment – remote computing and communications systems renting for between $18,000 and $35,000 a month."

He noted that RCA's computer business is growing at a faster rate than the industry as a whole. Domestic computer bookings for 1969 will reach an all-time high in dollar value, up more than 40% from the previous year, he added.

"At this rate," he said, "we expect to turn the profit corner early in the 1970's, provide a solid base for increased earnings in the years ahead, and challenge for second position in the computer industry."

Bradburn said the two management changes will enhance RCA's ability to concentrate its computer marketing efforts in computer-communications, with emphasis on remote computing systems and time-sharing.

To Specialize in EDP

RUTHERFORD, N.J. – Power Computer Systems, Inc. has concluded arrangements, subject to shareholders' approval, for the sale of the company's pipe, valve, fitting and industrial mill supply distribution businesses.

Details of the proposed sale will be contained in the proxy statement for a special stockholders meeting scheduled to be held in mid-February 1970.

Simco Signs Its DP Center to Synergy

OAKLAND, Calif. – Simco, one of the world's largest toy distributors, has divested itself of the data processing business with the signing of a $1 million contract with Computer Synergy, Inc.

Synergy has taken over the EDP facility including personnel and hardware.

"We'd reached a point where the computer had to handle additional work and provide more information to maintain our growth rate," said Albert Simon, Simco president.

"Synergy will implement a new system that would have taken us five years to get operating. They are doing it in six months."

Simco first entered the data processing realm in 1958 when it automated billing and inventory procedures.

Simco is one of a rapidly increasing number of companies handing their computer problems over to a professional EDP firm. Facilities managers have sprung up in response to skyrocketing EDP costs, a high rate of employee turnover and bewildering technical difficulties.

"By engaging a facilities management firm we're saving 20% of our previous EDP costs, plus getting more efficient use," said Simon.

Simco is the umbrella company for American Toy Co., American Sport Co. and American Model Distributors.

Brooks Gives Up Running DP Center

CLEVELAND – Central Data Systems, Inc. has reached an agreement in principle with Bobbie Brooks, Inc., providing for the management and operation of an electronic data processing facility for three New York-based divisions of Bobbie Brooks.

Under the terms of the agreement, Central Data Systems will assume the managerial and operational responsibility for the Bobbie Brooks data processing center located at the headquarters of the Stacy Ames Division at Long Island City (to provide data processing services for the Stacy Ames and Addenda Divisions, both producers of women's apparel) and for the Stretchini Division, manufacturer of clothing for children and preteens.

The center's present 30-member staff will become employees of Central Data, and Central Data will sublease the equipment from Bobbie Brooks.

Herbert Adler, president of Bobbie Brooks, said that the arrangement was expected to provide Bobbie Brooks with operating economies as well as an expanded support system.

Japanese Visit U.S. to Study Data Processing Field

NEW YORK – Computer job-hopping is virtually unknown in Japan, according to a team of visiting Japanese EDP specialists, but this has not prevented the development of a serious shortage of computer personnel in that country.

This fact was disclosed during a special program on EDP recruitment held for the Japanese visitors in the New York City offices of Robert Half Personnel Agencies, Inc. The 16-man team, representing as many different Japanese companies, has been visiting data processing companies and computer installations in this country, under the auspices of the Japan Productivity Center, Washington, D.C.

"A junior programmer starting on his first job in Japan gets $100 per month," says Half, "as compared to the going rate of $10,000 per year in this country. But Japanese benefits include life-long job security, company housing, vacation homes, automatic bonuses, pension, family allowances, health insurance and even commuter fares. These go far towards equalizing what might at first appear to be a wide discrepancy in salary scales."

The Japanese visitors said that tradition in their country makes it most likely an individual will spend his career with the company he first joins. While this may be in management's favor, it restricts recruitment almost entirely to in-house activities.

Tradition also makes it virtually impossible to fire an employee; if his performance on a job is not satisfactory, he is retrained for another. Length of service is a major factor in determining pay raises, and a top EDP specialist may earn about $5,000 a year in salary, before taxes. From the date a new man is hired, until mandatory retirement at age 55, the typical total cost to a Janpanese company per employee is about $140,000.

Half stated that the nationwide scarcity of computer personnel in the U.S. has resulted in an estimated turnover rate of 37% a year in these jobs, but that this figure is expected to start declining. He said the problem is compounded in some large companies by poor communications between the EDP and personnel departments, and unrealistic demands made by both.

"In some cases," says Half, "the personnel department will insist that an applicant's personality fit fairly rigid guidelines, regardless of the individual's ability to do the job."

The visitors indicated that the pace of computerization in Japan has grown rapidly since 1965. The number of computers installed at the end of September 1968 – the last date for which exact figures are available – was 4,171, and is said to be considerably beyond that now. This has led to a serious shortage of EDP specialists, particularly programmers and systems engineers.

The visiting team, which was comprised of EDP managers representing many of Japan's prominent corporations, had been touring the U.S. for six weeks visiting major computer manufacturers and installations, including IBM, RCA, Bank of America, Control Data Corp., U.S. Navy, and Stanford University, among many others.

GE Still Second Largest Industrial Computer User

NEW YORK – More than 400 digital computer systems, worth over $262 million, are at work in 170 General Electric Co. locations worldwide, a GE survey has disclosed.

This represents an increase of 14% during 1969, and continues to make GE the second largest industrial user of computer systems in the world, according to GE. Only General Motors is larger, the company said.

Of the 400 systems installed, 31% are small-scale computers in the $1,000 to $5,000 per monthly rental ranges; 61% are medium-scale systems ($5,000-$20,000 monthly rental) and 8% are large-scale systems (more than $20,000 monthly rental)

The report also disclosed that about 1,000 time-sharing terminals throughout the company are wholly devoted to serving the time-sharing computer needs of thousands of GE managers and specialists.

In addition, GE said it continues to maintain worldwide industry leadership in commercial time-sharing services. It has more than 75 systems installed serving 100,000 time-sharing users in 21 countries on five continents.

General Electric's data processing costs for 1969 were more than $120 million, including costs of equivalent leasing and of operating and personnel costs, or better than 1.4% of total company sales.

More than 4,000 GE men and women, about 1% of all GE employees worldwide, are employed in designing, programming, operating and servicing these in-house computer systems.

Computer Users Can Now Lease Access Flooring

SANTA MONICA, Calif. – A new and unique leasing program for computer room equipment is available through Liskey Aluminum, Baltimore, Md., and Liberty Leasing, Chicago.

Liskey Aluminum is a producer and supplier of access flooring, partitions, and modular airconditioning equipment for computer rooms.

The new program provides for the leasing of these items through Liberty Leasing's 48 offices.

The program is expected to be particularly effective because of the familiarity and acceptance by computer users of leasing, and because of tight money.

Air Force DP Division Reorganizes

HANSCOM FIELD, Mass. — A major reorganization planned for the Air Force Electronic Systems Division is designed to strengthen management of military information and command systems, according to Maj. Gen. Joseph J. Cody Jr., ESD commander.

Creation of a new Deputy for Command and Management Systems will centralize the division's computer-based activities, General Cody explained.

"We now have under one roof the data automation, system engineering, system analysis, computer equipment analysis, computer programming and computer operations resources of ESD," General Cody said. "This will significantly help the division provide better support and response to Air Force requirements for command and management information systems."

Included in the new 230-man deputate will be:

- The Electronic Data Processing Equipment Office, which selects all management-type computers to be purchased by the Air Force.
- A portion of the Space Defense and Command Systems Program Office dealing with the acquisition of command systems.
- Parts of the Directorate of Planning and Technology involved in command system design and development.
- Air Force computers at Hanscom Field and personnel involved in their operation.

Two Firms Work on Health Care Systems

MINNEAPOLIS – Control Data Corp. and Biomedical Computer Services, Inc., have entered into an agreement to cooperate in the development and implementation of total systems capabilities in the health care field.

Under terms of the agreement, Biomedical Computer Services of St. Paul, Minn., will develop a total integrated systems design including applications and problem-solving techniques for the administration and operation of hospitals, physicians' offices, clinics, extended care facilities, and other allied health care services.

Control Data will develop operating systems and related software and communications capability for medical utilities employing CDC 6000 series computer systems.

Biomedical Computer Services, Inc., has been engaged in the total systems development for the computerization of these health care services and will provide systems design application software, consulting services, and utility installation and management for a comprehensive national computer network.

Its principal executives consist of highly experienced medical and hospital administrative personnel.

Trade Shorts

The Comsonic Corp., New York-based on-line systems development company, has expanded the scope of its operations.

A. Dale Mayo, chairman and president, said the Comsonic will operate in three prime areas: hardware and software product development, on-line systems services, principally using its Comdac-8 and Comdac-10 systems, and consulting and software design.

Comsonic was formerly named Strategic Time-Sharing, Inc.

Time-Sharing Enterprises, Inc. of King of Prussia, Pa., has agreed with Compudial Corp. of Milwaukee, Wis., to market and support a series of time-sharing management decision application packages.

Western Data Sciences, Inc. of Phoenix has been appointed exclusive sales agent in the state of Arizona and the city of Las Vegas for Digitronics Data-Verter and Dial-O-Verter data acquisition and data communication equipment.

Western Data Sciences with its main office at 3550 North Central Avenue, Phoenix, specializes in the application of data processing equipment to the problems of business and industry.

The company's activities include: development and distribution of computer application packages, design, development and implementation of information systems, and marketing services.

Paper Manufacturers Co. announced that it will distribute the Data-Link line of perforator tape handling devices on a nationwide basis.

The equipment will be marketed under the Perfection trademark which identifies P.M. Co.'s entire data communications product line and will include automatic and manual rewinders, a unique splicer/perforator, a complete line of splicing patches, center feed unwinders and reels. A service that allows the user to design customized work processing stations will also be offered.

The company distributes its products through over 150 paper merchants throughout the U.S. and Canada.

Paper Manufacturers Co. is headquartered at 9800 Bustleton Ave., Philadelphia, Pa.

A nationwide network of local distributors has been enlisted by Robins Data Devices, Inc., of College Point, N.Y., to make its comprehensive line of perforator tapes and data processing accessories "instantly available."

In addition to what it claims to be the largest assortment of paper, laminated mylar and fanfolded perforator tapes, Robins produces a variety of accessories for EDP, communications, numerical control and similar applications. These range from correction and splicing patches to storage folders and canisters, and from manual and motorized perforated tape take-up devices, winders and unwinders to splicers and encoders.

The stocking-distributor program succeeds direct factory sales. It already includes some 30 franchises.

Orders and Installations

Under a $739,000 contract, the National Blue Cross Association plans to nearly triple the capacity of its nationwide data communications and information retrieval system by installing remote data-preparation and transmission terminals in 40 regional offices. Honeywell keytape devices and 40 selector units will link the offices with a central computer complex in Chicago over high-speed communications lines. When the system goes into full-scale use in 1970, the Chicago center will be equipped to receive and send claim questions and answers automatically from 75 Blue Cross and 73 affiliated Blue Shield plans now serving some 86 million Americans.

Trans World Airlines has leased two Comcet 60 computer communications systems for use in the aircraft integrated data systems installation at the TWA Kansas City data communications center. The five-year lease, which includes software and maintenance, is valued in excess of $900,000.

F.L. Hudson & Co., a Queensland engineering firm, has ordered an ICL 1901A from International Computer (Australia) Pty. Ltd. to assist with production scheduling and to improve the efficiency of its manufacturing resources. F.L. Hudson, a division of the K.G. Luke group of companies, is a large manufacturer of refrigeration and airconditioning line fittings in Australia.

A $200,000 data communications order from Alitalia Airlines, Rome, has been received by International Communications Corp., a subsidiary of Milgo Electronic Corp. ICC's Modem 2200 and Modem 4400 data sets will be utilized in the system to give Alitalia's central computer in Rome direct instant contact with all reservation points in North America.

A GE-415 information system has been ordered by the City of Oklahoma to perform applications ranging from utility billing to delinquent parking violations. The system will be used mainly in the area of police work and to store planning and engineering data.

The Cincinnati Province of the Sisters of Mercy has installed a shared computer facility to serve a dozen hospitals, 33 schools, and various other institutions. The NCR Century 200 is linked to the other Sisters of Mercy establishments by NCR 736 magnetic tape encoders. Three hospitals are also installing NCR series computers that will be used for payroll and general accounting purposes. St. Therese's Hospital, Waukegan, Ill., and the John F. Kennedy Community Hospital of Edison, N.J., will utilize Century 100s, and the McHenry Hospital in Chicago will install a Century 200.

A Control Data 6400/1700 has been installed at the technical computer center of Chrysler Corp., Detroit, Mich., to serve the technical computational needs for product planning and for the development office. The system is being utilized in applications that include analysis of proving ground and laboratory testing, and automotive design and manufacturing.

Mathematics students at St. John's Preparatory School, Danvers, Mass., are using a small PDP-8/S computer from Digital Equipment Corp., Maynard, Mass., to solve problems in mathematics and other areas.

The Canadian Post Office has purchased an electronic retina computing reader from Recognition Equipment (Canada) Ltd., the Canadian subsidiary of Recognition Equipment, Dallas, to process money orders at the Post Office's Ottawa data processing center. The system will be able to perform item accounting and detect defaced or fraudulent money orders.

A Burroughs B500 valued at $300,000 has been delivered to the New Britain (Conn.) Bank and Trust Co. When the B500 is completely installed, it will handle demand deposit accounting, update loan balances, print statements, and be used for automatic processing of checks and encoded documents.

A $1,200,000 order has been placed by National Data Control Inc., Dallas, for 51 Models 816 and 216 minicomputers from Computer Automation Inc. of Newport Beach, Calif. The computers will be used in real-time data acquisition systems, which include sensor devices and radio frequency communication links for telemetering data collected by the remote minicomputer to a data processing center.

An FR-80 computer output microfilm recorder has been delivered to Computer Micrographics by Information International of Los Angeles. The $225,000 system will take over many applications usually assigned to slower line printers, particularly in the information retrieval and the publications field.

Wolf Research and Development Corp., a subsidiary of EG&G, has made an agreement to install a Putnam Mutual Fund information system at the First National Bank of Boston. Wolf's organization will install and customize the software as well as install an IBM system to take advantage of on-line visual data display, direct access storage and retrieval, and multiprocessing techniques.

NCR has announced plans for installation of several NCR series computers. Ocean Products Inc., of Dover, Fla., and Olin of New York, a car rental company, have both ordered NCR Century 100s to handle accounting and general business procedure. Four Century 200s, which will be used for general accounting and inventory control, have been ordered by W.S. Badcock Corp., Mulberry, Fla.; Thalhimer Brothers, Inc., Richmond, Va.; Marvel-Schebler Products, Decatur, Ill.; and La-Z-Boy, Monroe, Mich.

Computer Utilities Northwest Inc., Seattle, Wash., has installed the Synergistics computer data system for general service bureau use including payroll and general ledger accounting. Other installations of Synergistics' computer data systems are located in Boston, New York, Los Angeles, and San Francisco.

The London brokerage firm of Hichens, Harrison and Co. has installed an NCR Century 100 to handle a variety of accounting and statistical work, including contract notes, postcontract reporting, client accounting, and portfolio management.

does your data entry system have cartridge and program card loading?

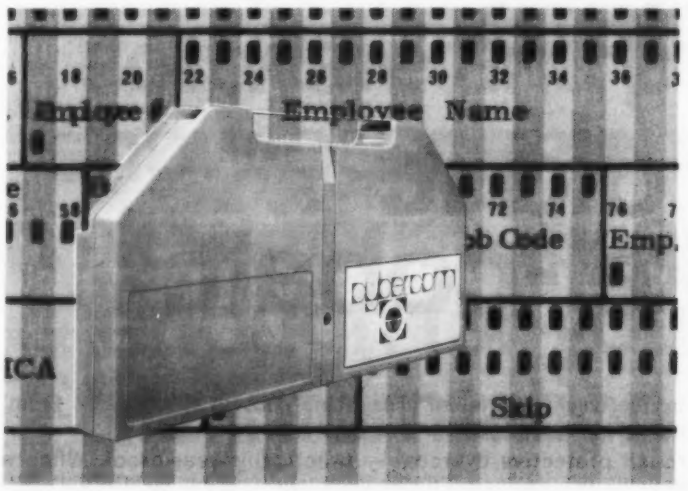
The Cybercom Mark I key-to-tape encoder uses a card for program loading to control keyboard operations and a ¼ inch tape cartridge for temporary storage of data to allow off-line pooling.

This means that changing of record format is rapid and error free. The features have been designed to provide a high efficiency factor for both small and large jobs.

The program automatically controls upper and lower case shifting, starting and ending of fields, skip, duplication, and left-zero operations. It is rapidly read into the Mark I memory by an optical reader.

Use of the program card and cartridge tape allows quick format changing for flexibility and convenience.

The Mark I system, with its error free program loading, quick cartridge loading, automatic error correction, and advanced human engineering, will increase the thruput of your data entry system.



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Acquisitions

World Computer Corp., Dallas, has acquired **National Communications Corp.**, also of Dallas, for an undisclosed amount of stock. World Computer offers computer software services, teleprocessing capabilities, equipment leasing and brokering, engineering design and development, and hardware systems manufacturing and marketing. National Communications furnishes engineering, installation, maintenance, and related services to the telecommunications industry, including telephone companies and equipment manufacturers.

Recognition Equipment Inc., Dallas, and **Datacraft Corp.**, Fort Lauderdale, Fla., have reached an agreement in principle under which Recognition Equipment would acquire 889,430 shares of Datacraft common stock and warrants to purchase an additional 499,169 shares of Datacraft common stock in exchange for the issuance to Datacraft of 142,309 shares of Recognition Equipment common stock. Recognition Equipment is a manufacturer of optical character recognition equipment. Datacraft Corp. is a manufacturer of digital computers and magnetic core memory systems.

American Medicorp Inc., Bala Cynwyd, Pa., owner-manager of acute care general hospitals and related health care facilities, has agreed in principle to acquire **Beehive Electrotech Inc.**, Salt Lake City, Utah, a manufacturer of electronic equipment used with computers for medical, commercial, and industrial applications.

KDI Corp., Cincinnati, Ohio, has acquired **RF Interonics, Inc.**, Bayshore, Long Island, N.Y., for an undisclosed amount of KDI common stock. KDI is an international company serving the electronics and computer industries, aerospace and defense programs, environmental sciences markets, education, and physical recreation. RF Interonics designs and manufactures electronic components for radio frequency control.

Madjac Data Co., Inc., Jackson Heights, N.Y., a data processing firm, has acquired the **Messenger Mart Division** of The Social Print Mart, Inc., Queens, N.Y., for an undisclosed amount of cash.

Crown Reserve Mines, Inc., Salt Lake City, Utah, has agreed to merge with **Computer & Systems Resource Management, Inc.** of Dallas. The merger proposes that the common stock of Computer & Systems Resource Management be exchanged for 1,033,500 shares of Crown's common stock. Crown has been engaged in exploration of mining properties held by it in Utah since April, 1969. Computer & Systems Resource Management is engaged in providing consulting and other services which are designed to assist client companies in obtaining the maximum potential from computer and data processing systems. Crown Reserve Mines, which is to be the surviving company, proposes to change its name to Computer Systems Management, Inc.

Brandon Applied Systems, Inc. of New York, has reached an agreement in principle to acquire **College Campus Promotions, Inc.**, for an undisclosed amount of stock on a pooling-of-interests basis. Brandon Applied Systems is an international management and technical consulting firm specializing in data processing and information sciences, EDP education and training, programming and proprietary software, and publishing and printing. College Campus Promotions is a marketing, sales promotion and publishing organization marketing to over 300 university and college campuses in 48 states and the District of Columbia.

Automatic Data Processing, Inc., Clifton, N.J., a computer services company, has reached an agreement in principle to acquire **Electronic Data Service, Inc.**, a Chicago-based data processing services firm. It also signed contracts to acquire **MSM Computer Service** of New York, and completed the acquisition of **Tamcor, Inc.**, a New York City data processing firm.

Calculator-Computer Leasing Corp. Pittsburgh, Pa., has acquired **Caribe Data Processing, Inc.**, a computer service center in San Juan, Puerto Rico, for cash and CCLC stock. The purchase includes a computer programming school, Royal Computer Institute, also located in San Juan. Caribe Data Processing develops computer programs for payrolls, inventory control, accounts receivable, and bookkeeping functions, and markets a complete computer service for these functions.

Sigma Instruments, Inc., Braintree, Mass., has purchased the assets and business of the **General Reed Co.**, Clark, N.J., for stock. Sigma Instruments supplies industry and the military with components designed for applications in electronics, avionics, aerospace, and public utilities. General Reed manufactures a complete line of miniature reed relays and Form A and C reed switches for sale to the electronics and industrial original equipment manufacturer.

Hospital Corp. of America, Nashville, Tenn., a chain of proprietary medical hospitals, has agreed in principle to acquire **Real Time Computer Systems, Inc.**, also of Nashville, a computer service company. The agreement calls for an exchange of one share of HCA common stock for six and one half shares of Real Time common. HCA would acquire all outstanding Real Time stock.

Comress, Inc., Rockville, Md., a computer software and consulting firm, has acquired an 80% interest in **Complex Systems, Inc.** of New York, a company that specializes in the development of custom teleprocessing computer systems for financial institutions and organizations.

EDP Technology, Inc. Washington, D.C., has acquired **Computer Systems & Software, Inc.**, Orlando, Fla., for an undisclosed amount of stock. EDP Technology is engaged primarily in developing and applying new systems and technologies, including computer technology, to problems in education, health, urban affairs, and industry. Computer Systems and Software is engaged in computer system design, selection and programming for business, process control and communication systems.

Expansions

Westinghouse Opens Five Centers

PITTSBURGH, Pa. – The Westinghouse Electric Corp. has just opened five new tele-computer service centers bringing time-sharing, remote-batch, and batch computer services to business and industrial customers in the northeast quarter of the U.S.

The new centers are located in Boston, Buffalo, Cincinnati, Detroit, and New York. Three previously announced tele-computer service centers are located in Chicago, Philadelphia, and Pittsburgh.

The eight centers offer a variety of computer services, falling into five broad categories: batch computer processing, remote-batch processing, time-sharing, numerical control consulting and tape preparation, and systems consultation.

Several computer programming languages are also available, including Basic, Fortran, Cobol, PL/1, and several Westinghouse-developed N/C languages.

Republic Opens New Computer Service Center

LOS ANGELES – Republic Corp. has officially opened its new computer service center here.

The center, managed by System Development Corp., is located at 7660 Gloria Ave., Van Nuys. It began operations on an IBM 360/65.

Major customers include large data processing users seeking to supplement their own data processing requirements. Additional services incorporating remote terminals for specific applications will be offered in the next few months.

Republic has been acquiring privately owned companies in the computer software and services field.

SDC, a computer software firm, has been engaged in the development of real-time information systems, computer timesharing, high order programming languages, and general purpose data management systems.

Other Expansions

International Computer Products, Inc. of Dallas, has opened an eastern regional sales office. The region to be serviced by this office comprises those states east of the Ohio and Mississippi rivers to the Atlantic coast. The address is 34 W. Putnam, Greenwich, Conn.

Hudson Leasing Corp. has moved its corporate headquarters to Great Neck, L.I., N.Y. The company occupies 4,200 sq ft in an office building located at 1 Linden Place, Great Neck. Hudson Leasing Corp. leases medical, agricultural, photographic marine, and data processing equipment.

General Automation, Inc., Orange, Calif., has opened a new sales and service office in Houston. The office is located at 4660 Beechnut, Suite 202.

The Computer Systems Division of Graphic Controls Corp., Buffalo, N.Y., has opened a Dayton, Ohio, sales office at 5055 N. Main St. The new office will provide resident sales and technical assistance to expanding commercial, industrial, scientific, and educational markets for remote terminal computing in the Dayton-Cincinnati area.

Boole & Babbage, Inc., Palo Alto, Calif., has established an eastern technical office in New York at 360 Lexington Ave. The company is a designer of computer-measurement software.

Honeywell's EDP Division has expanded its Lowell, Mass., manufacturing facilities by acquiring 20,000 sq ft of renovated space in a former mill building at 271 Jackson St.

Information Control Corp. has opened its fourth regional office in Minneapolis. It is located at Griggs-Midway Bldg., 1821 University Ave., Suite 187, St. Paul, Minn. 55104. The office will offer applications engineering assistance, as well as field engineering service to ICC's customers in the Midwest. Company products include military and commercial core memory systems, light pens, integrated circuit modules, and special computer peripheral systems.

Iomec, Inc., Santa Clara, Calif., has established an eastern regional sales office in Waltham, Mass., at 440 Totten Pond Road. Iomec is a manufacturer of disk drives and controller systems for small- to medium-size computer systems.

Sycor Moves to New Location

ANN ARBOR, Mich. – Sycor, Inc., manufacturer of data entry video terminals and systems, cassette recorders, and cassette-to-tape-converters, has completed a move from its former 24,000 sq ft, multi-location facilities in downtown Ann Arbor to a 114,000 sq ft, one-story building some three miles away, adjacent to Interstate Highway 94.

According to Samuel N. Irwin, president, the move, which took place during the Christmas holiday season, was accomplished on-schedule with minimal interruption of production, now in the assembly-line stage.

The new facility, located on a 28-acre tract in the Ann Arbor Industrial Park, now houses the company's 173 administrative, research, marketing, engineering, and manufacuturing employees. The new plant's capacity is 8,000 terminals a year on a one-shift schedule, Irwin said. The company has provided in its planning for a 50,000-sq-ft addition to the structure to meet future demands, he reported.

With its newly expanded facilities, and location in southeastern Michigan, Irwin said, Sycor is in a position to develop volume production capabilities required by the rapidly growing terminal field. The concentration in this area of tooling specialists, sub-contractors, engineering and assembly line personnel experienced in mass production is deemed far superior to anything existing on the East or West Coasts.

Founded in August, 1967, Sycor was the first company to develop, manufacture, and market programmable video terminals incorporating a microprocessor capable of executing instructions which have been programmed into a read-only-memory. Delivery of the first terminal to customers was made in February, 1969, and assembly-line production began in July of 1969.

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This is a fourth generation interactive computer with a 256K-36 bit word core. It is the first time-sharing computer to handle overhead in an economical manner while number-crunching tasks are slammed through tremendously fast, optimized areas. Each user has up to 64K words available in core and can control access to his files at security levels up to 'inviolate.'

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All software for the IC-7000 was developed in conjunction with Call-A-Computer, Inc.

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Expansions

NCR Software Groups To Get New Facility

DAYTON, Ohio – NCR has plans for an 84,000 sq ft computer software development and distribution facility here which will also serve as headquarters for NCR's network of regional customer support centers.

A company spokesman said that NCR will establish the facility several miles from the company's complex in S. Dayton. Some 500 employees will move to the new location in the spring.

Included in the facility will be a 9,000 sq ft computer center which will house eight NCR computer systems.

The new building will become headquarters for NCR systems service centers located in suburban Los Angeles; Dallas; Atlanta, Ga.; Hartford, Conn.; San Francisco; Chicago; and Jersey City, N.J., in addition to Dayton.

Short Bros. & Harland Opens Computer Facility

BELFAST, Northern Ireland – Short Brothers and Harland Ltd. has opened an industrial computer installation here. The facility comprises an ICL 1903A computer, partly built at the nearby Castlereagh factory of International Computers Ltd., and installed in a newly remodelled suite of offices in the administration building.

Shorts began using computers for design and engineering calculations in 1957. Since then four computers have been used and their applications widened to embrace some accounting and production control tasks. These applications will be further extended with the commissioning of the new computer which, in addition to its work on design and engineering calculations, will be devoted to a very wide range of managerial services. An existing computer, at present used purely for design work, will be phased out in 1970 as more work is placed on the new machine.

Among the functions of Short Brothers and Harland are systems analysis; program writing; data preparation and computer operation for design calculations (on problems such as wing stressing and missile trajectories); stock control; progress information for production control; costing personnel records; and the preparation of salaries.

Programs have been prepared in a variety of computer languages for handling the jobs. The computer services department has taught over 50 engineers, in most of the technical departments, to write their own programs in an "open shop" scheme.

New DP Center Established by GT&E

ERIE, Pa. – A new link is being added here to a growing national network of regional data processing centers being established by GT&E Data Services, a subsidiary of General Telephone & Electronics Corp.

Construction has started on a new $2 million computer center to serve the central data processing needs for customers in 11 states of the northeast. Completion date for the center is scheduled for September, 1970.

The center is one of six GT&E Data Services is opening to offer a data processing system of national scope through strategically located large-scale computer centers and branch marketing offices.

This network is available to financial institutions such as savings and loan associations, banks, and credit unions; and other fields are being explored by the company such as medicine, education, government, and television.

GT&E Data Services is also providing computer systems and programming services aimed at expanding and improving the General System telephone companies present-day data processing operations.

Other Expansions

Recognition Equipment Inc., Dallas, manufacturer of optical character recognition equipment, has begun construction on a 200,000 sq ft manufacturing building on land it acquired in 1968 in Irving, Texas, a Dallas suburb. Completion of the building is expected in late 1970.

Computer Consoles, Inc. of Rochester, N.Y., has relocated its manufacturing and engineering operations into a recently renovated building at 1257 University Ave.

Hooker Chemical Co., a subsidiary of Occidental Petroleum Corp., has opened a new computer center located on the Niagara Frontier at Grand Island, N.Y.

Data Products Corp. of Los Angeles has opened three new branch marketing offices for its Systems Division in Miami, Fla., St. Louis, Mo., and Boston.

DSI Systems, Inc., Rockville, Md., has opened a midwest sales office at 110 S. Dearborn St., Chicago.

Information Services Inc., Babson Park, Mass., has opened a data center in Uxbridge, Mass. The facility is the major data input preparation center for the company and features optical scanning peripheral equipment.

Data & Information Products, Inc., Princeton, N.J., wholly owned marketing subsidiary of Applied Data Research, Inc., a computer software and service company, has opened a Raleigh, N.C., sales office.

The corporate office of Electronic Memories & Magnetics Corp. has moved to 3435 Wilshire Blvd., Los Angeles. EMM is a supplier of information storage and retrieval products, magnetic materials and equipment, and electronic products used in the computer and electronics industries.

Raytheon Co.'s computer operation has opened a San Francisco district sales and service office at 363 S. Taaffe, Suite 201, Sunnyvale, Calif. 94086. Sales of Raytheon 703 and 706 computers and the new 704 minicomputer will be conducted throughout northern California, Nevada, Oregon, Washington, Utah, and Idaho.

Univac Forms Terminals Division

NEW YORK – Univac has formed a new group to be known as the Communications and Terminals Division.

The group will increase Univac's penetration of the terminals market, the fastest growing segment of the computer hardware industry.

The new group has been initially formed as a separate entity within Univac's Data Processing Division. It is responsible for the development, manufacture, and marketing of all Univac communication and terminal equipment including the Uni-

New Divisions

scope 300 and Uniscope 100 displays, the Univac 1557/1558 graphic display subsystem, the new DCT 1000 and DCT 500 remote terminals. Univac's new DCS-1C (IBM 360 compatible) data communications subsystem, and communication modems, programmable concentrators, and multiplexers.

The group's activities are aimed at all users of computer systems, since the Univac communications and terminals products are compatible with most systems now operating.

The new division will include the industrial products department that incorporates the former OEM marketing department

It handles all sales of Univac equipment to original equipment manufacturers, for incorporation into their own products.

Computer Sciences Corp. Forms Development Div.

LOS ANGELES, Calif. – Computer Sciences Corp. has formed a Development Division to develop the future computer-based systems that the company will market as proprietary products.

The new division will also be responsible for developing the advanced systems software that the company supplies to computer manufacturers and major users of computers.

The Development Division will produce the systems software and numerous applications programs required by CSC's largest proprietary venture to date, the establishment of a nationwide information network.

The new CSC network will supply more than the traditional remote services such as conversational time-sharing and batch processing of data. It will include industry packages providing completely processed business information on a time-shared basis. Integrated sets of applications programs developed by CSC will make it unnecessary for subscribers in a number of industries to perform programming of their own.

The new division will also develop future proprietary packages which the company sells for use on the purchaser's own computer.

Other Divisions

★ International Systems Associates, Ltd. has formed a new division, ISA Forms Inc. of New York.

The new division will market a complete range of business forms, computer tapes and disks, ribbons, and punch cards.

ISA has also formed a new mail order division.

The new division, J. Carlton's Inc. of New York, will utilize recent ISA advances in mail order data processing technology to market new and unusual items that range in price from $3 to $300.

International Systems Associates, Ltd. is a full service data processing organization providing systems analysis, design, installation and implementation.

★ Automatic Data Processing, Inc., New Jersey-based computer services firm, has formed Automatic Data Processing of New Jersey as a separate operating division of the parent company.

The new division will handle the company's New York/New Jersey business from ADP's new computer center in Clifton.

★ Data Processing Financial & General Corp. (DPF&G) has integrated its two major operating divisions into a new Systems Division.

In forming the Systems Division, DPF&G has merged the personnel and facility resources of its Information Systems Company Division and its Data Center Division.

The Systems Division currently has offices and facilities in New York, Boston, Washington, D.C., Detroit, Los Angeles, Houston, San Francisco, Mountain View, Calif., and Anaheim, Calif.

Contracts

Management Science Systems, Inc., Rockville, Md., has been awarded a contract by Esso Mathematics & Systems, Inc. to develop an advanced mathematical programming system for IBM 360. The new EMPS/1 system will be installed at Emsi headquarters, Washington, D.C., and at other affiliates of Standard Oil Co. (N.J.). Under the contract, Management Science will maintain and expand the system over a number of years.

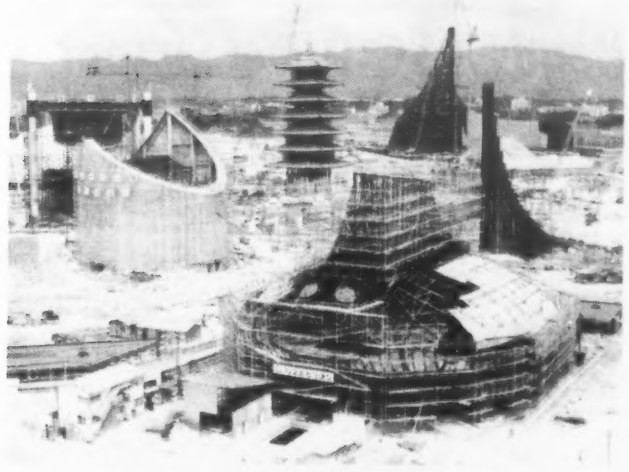
Comcet, St. Paul, Minn., and Digital Development Corp. have entered into a long-term contract with an expected term value in excess of $1 million for DDC 73 series rotating digital memory units. The units are now being used in the recently announced Comcet 40 and 60 systems, which are designed to relieve the communications load on major computer installations.

Digital Technology Corp. of Halesite, N.Y., has signed a contract calling for deliveries early in 1970 of digital control systems to be used in manufacturing the products of E.R. Squibb & Sons, Inc.

Tel-Tech Corp. has received a contract to install 20 of its TTC-1000 data communications multiplexers for the nationwide time-sharing network, Share OS/36, now being implemented by U.S. Time-Sharing, Inc. The multiplexers can be expanded at any time, starting with as few as two channels, and increasing in capacity by plugging in additional channel cards.

Under project Omega, Cern, the European Nuclear Organization, has ordered a system from Compagnie Internationale pour l' Informatique for the acquisition and analysis of data retrieved from a spark chambers system located in the magnetic field of a large magnet.

Japan Uses Computers to Make Expo '70 Model of 'Informationalized' Society



Seventy-nine countries will participate in the computerized Expo '70 to open March 15, in Osaka, Japan.

OSAKA, Japan – With its March 15 opening rapidly approaching, the 1970 Japan World Exposition is already bebeing discussed as marking the dawn of a new industrial revolution that will make it truly a symbol of "Progress and Harmony for Mankind."

According to the Japan Trade Center, New York, Japan intends to use Expo '70 as a model of an "informationalized" society, in which nearly everything will be done with the aid of a computer. The aim is to come up with a revolutionary new form of city planning that will, at the same time, help solve the complex information handling problems associated with a giant world's fair.

At Expo '70, all available information about buildings, roads, exhibits, visitors, the weather, etc., will be fed into five huge electronic computers making up the management information system (Mis). As a result, for example, it will take only seconds to reunite a lost child with his parents. All crucial facts about the child – such as age, color and style of clothing, facial appearance and other physical characteristics – will be stored by the computer. When his parents inquire at Expo's center for lost children, the child's face will immediately appear on a TV screen. The same system will be used to speed up return of lost articles.

Another function of Mis will be to provide an instant answering service for questions about the fair by people anywhere in Japan, as well as visitors on the exposition site. Just by picking up a phone, it will be possible to get an instant answer about how crowded a certain pavilion is at the moment, whether parking space is still available in a particular place, what is going on at the various shows and exhibits, and what the prices are.

The "informationalized" city is just one of the exciting roles that computers will play at Expo '70. At the "Computopia" (computer utopia) exhibition hall, part of the Furukawa pavilion, visitors will see further demonstrations of the possible role of computers in future human society.

A tribute to the sophistication of Japan's software industry, the Computopia hall will feature such attractions as a computer that can identify a person by his voice or facial characteristics. To show how such a computer might function in a future cashless age, visitors will be able to participate in a shopping game in which the computer recognizes the voice of a customer in the crowd and hands him his bill.

There will also be a computer called Johann "Electronics" Bach, which instantly composes and plays music on an electronic organ when fed a random combination of notes chosen by the visitor. Still another will design new fashions, free of charge, for visitors.

Even the ancient art of palm-reading will be taken over by computers at Expo '70. One pavilion will feature a personality analysis corner, with a computer that tells a visitor what type of person he is from the lines in his palm and his facial features as read by a special camera set-up.

The fair will also feature Time Capsule Expo '70, a collection of documents and objects to be left for future generations to examine 50 centuries from now.

Time Capsule Expo '70, the largest of its kind ever to be produced, will include such items as an atomic timepiece, the size of a small gas lighter, which will count time for 20,000 years, women's accessories, reproductions of masterpieces of art, scrolls illustrating the life of the average family in the 20th century, and tape-recorded street sounds.

Information will be stored in the Capsule through an electronic beam micro-etching technique capable of recording 100,000 ordinary book-size pages on 1,000 silicon wafers, small enough to fit in five cigarette packs.

Johnson V.P. for World Systems

WASHINGTON, D.C. – John D. Johnson has been named to the newly created position of vice-president, corporate development of World Systems Laboratories, Inc. He had been vice-president of marketing.

Johnson will have full responsibility for the investigation of new lines of business activity beyond the scope of the company's present activities, but still within the field of electronic data processing.

In this position, he will also explore the possibility of corporate acquisitions.

Johnson is a former assistant director of the Office of Economic Opportunity, where he established the OEO Management Information Center and the government-wide Federal Information Exchange System.

In addition, he directed the development of the OEO systems for the Job Corps, Vista, and the Community Action Program.

He was also responsible for the development of Federal Information Exchange System; the Catalog of Federal Assistance Programs; the Summary of Federal Programs; and the Community Profiles, which consolidated information from a number of other federal agencies.

Prior to joining OEO, Johnson was an official of the Defense Atomic Support Agency, where he administered the Program and Budget Office for the Nuclear Weapons Development and Research and Test Programs.

Johnson also served as the senior data processing official for the Defense Atomic Support Agency. He was responsible for monitoring the development of all data processing applications, scientific and administrative, throughout Dasa. In addition, he assisted in the development of military construction activities at Johnston Island, the Pacific nuclear test site.

Executive Corner

Jackson Heads CSC Development

LOS ANGELES – Donald A. Jackson, newly appointed president of Computer Sciences Corp.'s Development Division, has directed CSC's activities in the development of major programming systems for some of today's largest and most advanced computers during his almost six years with the company.

Among his other CSC assignments, he served as director of the company's operations at Nasa's Marshall space flight center. In that capacity, he organized and directed a staff of 500 CSC personnel who provide technical and operational support to the space center's computation laboratory.

Immediately prior to his new appointment, Jackson was assistant to the president of CSC, with responsibility for special assignments in operations and internal planning.

Jackson acquired his initial experience in the computer field in the aerospace industry. Before joining CSC in 1964, he was associated for 12 years with, first, Lockheed Aircraft Corp., and then Aerojet-General Corp.

At Aerojet, he headed the Computing Sciences Senior Division, an organization employing more than 400 persons who provided complete computing services to the company's plants at Sacramento, Calif.

Olesten Manages S-Cubed Mfg. Systems Div.

LA JOLLA, Calif. – Nils O. Olesten, formerly manager of Univac numerical control activities in Europe, has been named division manager for the Advanced Manufacturing Systems Division of Systems Science and Software.

Olesten will be responsible for developing and marketing the company's software packages used to automate planning, tooling, and production systems in the aerospace, shipbuilding and automative industries. These advanced manufacturing systems using computer-aided engineering production techniques, include systems for numerically controlled machine tools, production monitoring, and process control.

Also included is the Viking shipbuilding system, an integrated package of computer programs that automate the engineering, lofting, and production phases of shipbuilding.

A native of Sweden and a fifteen year U.S. resident, Olesten has had wide experience developing numerical control programs for such aerospace firms as Georgia Division of Lockheed Aircraft Corp., and the Rohr Corp. of Chula Vista, Calif.

Vandermark Appointed President of NCC

NORRISTOWN, Pa. – Harold F. Vandermark has been appointed president of Nu-Concept Computer Co.

Vandermark, for the past 23 years, held various responsible management-level positions with Univac. As engineering location manager for their Field Engineering Division, he was responsible for groups of personnel in engineering liaison, publications, and parts logistics. In this latter activity, he was responsible for all spare parts used in Univac's large-scale and medium-scale computer installations throughout the world.

Vandermark was also responsible for setting up and managing the maintenance of all Univac computer equipment sold to the U.S. Government overseas in Europe, the Far East, South East Asia, and the Pacific Islands.

His last managerial position with Univac was that of national program manager. In this capacity, Vandermark worked with five regional and 35 branch offices.

RCA Appoints Trudel Dir. of Corporate Eng. Serv.

NEW YORK – A. Robert Trudel has been appointed director, corporate engineering services of RCA.

Trudel's responsibilities include RCA corporate programs concerned with engineering education, engineering professional development, technical information retrieval, standards, computer-aided design, and technical papers and publications.

He is also responsible for the RCA frequency bureau, which handles the

(Continued on Page 48)

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Director Recap

Ronald C. Simone, chairman of the board of directors of Certified Systems, Inc., has been Data Corp. Simone is also president of Securitext, Inc.

Three Dallas-area computer executives have been named to the board of directors of Data Dynamics, Inc., Richardson, Texas.

Named to the board were: Fred A. Speaks, president of Seaco Computer-Display, Inc. of Garland, Texas; R. Scot Clark, a vice-president of Seaco; and Ted R. Willis, engineering vice-president of Data Dynamics.

James Devlin, president of Data Automation Co., Inc., has been elected to the board of directors of Data Tab Computer Corp.

John G. Bartol has been elected to the board of directors of Trilog Associates Inc.

During the last five years, Bartol was a partner in the law firm of Pepper, Hamilton and Scheetz, where he specialized in corporate matters.

Dr. Bertram Herzog, professor of industrial engineering at the University of Michigan, has been elected director of Information Displays, Inc., specialists in interactive computer-controlled graphic display systems.

Princeton Time Sharing Services, Inc., has unanimously re-elected Richard D. Wellbrock to the board of directors of the Princeton, N.J., computer-related service company.

Wellbrock is vice-president of the New York-based Mayflower Securities Co.

Garner Dunkerley Jr., has retired as chairman of the board of Ennis Business Forms, Inc., but will remain as a director of the company.

Following Dunkerley's announcement, Leonard F. Gehrig, president and chief executive officer, said that the position of chairman of the board would remain unfilled for the present.

Dunkerley joined Ennis Business Forms, Inc., in 1924, was elected chairman of the board in 1966, and has served as president since 1955.

Robert F. Gibeau has been elected to the board of directors of Data Group Inc., a systems and data processing organization.

Gibeau is currently executive vice-president of Duncan Ceramic Products, Inc. but will be leaving that company's employment on Jan. 1, 1970, to reactivate his previous management consulting practice, R.F. Gibeau and Associates. He will continue as a consultant to Duncan Ceramics.

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Executive Corner

(Continued from Page 44)

company's liaison with national and international groups involved in the study and allocation of the radio frequency spectrum. He will have offices at the David Sarnoff Research Center in Princeton, N.J., and in Camden, N.J.

Trudel succeeds Wendell C. Morrison, who was recently named staff vice-president, product safety.

Before joining RCA earlier this yerar as staff engineer, product engineering, Trudel spent four years with the Scott Paper Co., Philadelphia, as assistant to the vice-president, research and engineering, and later as assistant director of corporate development.

Michael L. Mark Elected V.P. of Intercomp

CAMBRIDGE, Mass. – Michael L. Mark, director of system engineering with Intercomp, has been elected vice-president in charge of computer products. He will be responsible for development, marketing, and production of computer equipment for the general data processing market.

Mark was graduated from MIT in 1967 majoring in pure and applied mathematics. He is presently working toward a Master's Degree in the communications and control section of the MIT electrical engineering department.

From 1967 to 1968, Mark was manager of programming systems with IRA Systems, Inc., of Waltham, Mass. He was responsible for the software development on all projects, which ranged from data processing applications to bridge simulators.

He was project manager for the implementation and delivery of the Navy Star-X computer system, a major subcontract for the Navy Star-X program. This involved the development of necessary hardware and software to automate control of a radar dish.

Mark was also responsible for the design of a low-priced computer aimed at the industrial market.

Other Moves

■ Glen S. Waterman has been named a senior scientist in the Systems Division of Computer Sciences Corp., Los Angeles. He will be responsible for the technical review of the systems engineering and research activities carried on at the eastern region headquarters of CSC's Systems Division at Falls Church, Va. He will also provide technical direction to the company's effort in complex projects, and conduct special studies in such areas as nuclear weapons effects.

■ McDonnell Automation Co., St. Louis, Mo., has promoted Michael F. Shanahan to national sales manager of its newly created computer-aided manufacturing sales department.

■ Howard G. Figueroa has been named vice-president, marketing and development for IBM's Data Processing Division. He will be responsible for five key areas: marketing, systems engineering and education, custom contract services, marketing, development, and market operations.

■ General Automation, Orange, Calif., has appointed Robert C. Henriques as area manager for its eastern region. He will manage the marketing activities of GA's computer-based industrial automation products and services throughout the eastern states.

■ The appointment of two assistant vice-presidents in the Marketing Division has been announced by NCR, Dayton, Ohio. S.E. Loewy has become assistant vice-president, systems services; and G.P. Williamson, assistant vice-president, EDP.

■ Robert M. Anderson has joined Computer Micro-Image Systems of Northridge, Calif., as vice-president of manufacturing.

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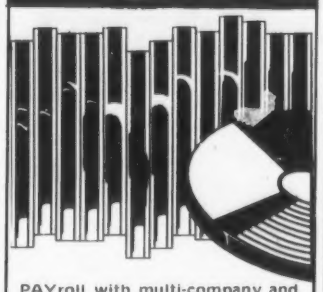

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MEMOREX

15% Growth Rate May Be Tested

Poll of DP Managers Reveals Budget Tightness in '70

By Michael Merritt
CW Staff Writer

BOSTON – The enshrined 15% growth rate of mainframe manufacturers may be in danger in 1970.

A telephone poll of EDP managers for many of the nation's top 100 industrial computer users showed that inflation, high interest rates, and an unsettled economic future have forestalled expansion plans of over 50% of the companies.

The prevailing mood in *Computerworld*'s straw poll was one of belt-tightening, "cranking more out with what we've got."

About half of this 50% plan some form of minor upgrading, generally in the form of adding more core memory.

The general feeling, though, was that with a shrinking corporate budget, EDP managers will be weeding out less productive programs and assigning more strict priorities to use of computer time.

About 20% of the respondents indicated that they planned major expansions, above the 15% "normal" growth rate, while a balancing 20% replied that they were faced with overcapacity, and would not expand their facilities even with favorable financial climate in 1970.

Generally, overcapacity resulted from completion of expansion programs rather than overly optimistic forecasts.

Respondents who indicated major increases in capacity said either they were catching up from a late start, or were branching out into service bureau operations.

In line with the push toward greater efficiency is another trend toward centralization or regionalization, and toward greater use of interactive systems. About 30% of the EDP managers said that they did plan to add more remote terminals "to bring the user closer to the computer," and presumably lower overhead by decreasing programming costs within the EDP services division.

Similarly, about 30% mentioned a shakeout, closing unprofitable installations and merging them into larger centers.

Even if the battle plan for 1970 was retrenchment for most companies, only one firm admitted it intended to decrease its programming staff; the market for computer professionals is still tight.

Many of the firms reported budget increases of 10% to 20% that would yield little if any increase in throughput. The explanation for this was once again inflation, which seems to be affecting programmers' salaries greatly.

The top 100 industrial users of computers, less than 1% of the nation's computer users in numbers, use about 20% of the non-government computers in the U.S. The straw poll included only industrial concerns, and did not cover financial institutions. A random selection from the top 100 did include firms of all sizes in that group, and covered a wide range of industries.

Sources in Industry Predict Continued Record Breaking Growth in New Year

BOSTON – The beginning of a new year and new decade seems to inspire gazing into the future, and a number of industry sources have dusted off their crystal balls and forecast a rosy future for 1970.

The Association of Data Processing Service Organizations has predicted that computer services revenue will exceed $2.4 billion in 1970, reflecting their belief that computer services will continue to grow at the 20% to 30% rate of the last three years.

Breaking out revenues from the three major segments of the industry, Adapso assigns $1,325 million to data processing centers, $800 million to software firms and $350 million to time-sharing companies.

The association believes that revenue for software firms should increase at a rate of at least 20% to 30%.

The time-sharing segment of the industry appears to have grown at a rate of 60% to 80% in the past year and there is no reason to expect a significant decline in this rate, they said.

Manufacturers Confident

Robert E. McDonald, president of the Univac Division of Sperry Rand stated that he expected the computer industry to maintain its 15% growth rate, and that shipments by American manufacturers would reach $9.6 billion in 1970.

According to McDonald, "despite measures by the U.S. government to 'cool-off' the economy and the predictions of some economists of a slight downturn this year, the market for computer systems continues to be broadly based with no signs of any saturation level in sight."

National Cash Register's Chairman Robert S. Oelman predicted that the business machine industry "will achieve another sales record in 1970" and will have a growth rate "substantially better than that of the economy as a whole."

Oelman noted that low-cost computer systems for small businesses are an important factor in the 1970 outlook.

Both Oelman and McDonald added that business machines increase efficiency and reduce operating costs, and thus should be even more desirable in a time of economic squeeze.

T. Paul Bothwell, vice-president of Honeywell's Computer Control Division, was even more exuberant in speaking of his operation's future. He stated that he expects a 50% rise in sales because of the "explosive performance by the minicomputer and time-sharing computing markets."

Bothwell said that Honeywell market studies show a $500 million demand for computers costing under $25,000 by 1972.

University Computing to Buy Only 35% Of Computer Technology From LTV-Aero

DALLAS – University Computing Co. has canceled plans to acquire and merge with Computer Technology, Inc. Instead it will purchase half of the 71% interest in the company owned by LTV Aerospace, a Ling-Temco-Vought subsidiary.

The new agreement, which is expected to be consummated in January, calls for University Computing to acquire two million Computer Technology common shares, a $2.5 million Computer Technology debenture and all the company's outstanding warrants to purchase common stock.

For this, University Computing will pay $20 million in cash on or before March 1, 1970, and will exchange its ownership in the Academy of Computer Technology Inc., a subsidiary, and the outstanding common of Alcorn Combustion Co., a wholly owned subsidiary.

Prior to March 31, 1972, LTV Aerospace will have the right to sell its interest in the Academy and Alcorn back to UCC for $17.5 million in cash or UCC common stock.

The agreement provides that for a three-year period UCC will furnish corporate, financial, marketing and operating management advice and consultation relating to the operations of CT.

UCC will also provide the same services relating to the operations of Academy and Alcorn.

LTV Aerospace and CT each will pay $200,000 per month for these services. The aggregate management fee to UCC per year will be $4.8 million plus the direct costs of performing such services.

Both companies have agreed to vote their CT shares at any CT stockholders meeting for the election of directors in favor of Paul Thayer, president of LTV Aerospace, and James J. Ling, chairman of the board and chief executive officer of Ling-Temco-Vought, Inc. LTV Aerospace has agreed that it will vote its shares in favor of any nominees of UCC.

Each company will retain the right of first refusal if the other wishes to sell its CT stock, and LTV Aerospace will participate to the extent of 50% of all future CT financing in which UCC also participates, up to a maximum of $10 million.

Though LTV Aerospace would not comment on the reason for the change in plans, a UCC spokesman said that a merger wasn't feasible now because Computer Technology's "new concept of facilities management is in advance of total market acceptance."

Computer Technology provides complete management of a customer's computer operations while UCC supplies only programming and computer time.

UCC noted that there are "both practical and economic drawbacks when something as advanced as Computer Technology's concept has not been well accepted."

LTV Aerospace said that it does not intend to sell its remaining Computer Technology holdings.

Dallas Court Gives Shuttered SCC More Time to Work Out Reorganization Plans

DALLAS – Bankrupt and shuttered, Scientific Control Corp. has been given extra time by a Dallas judge to prepare its reorganization plans.

SCC said it filed a plan of arrangement under Chapter 11 of the Federal Bankruptcy Act where it would issue 2,010,000 shares of its common to Great Southwest Corp., Fort Worth, for a cash consideration of $2,010,000.

Under the plan, Great Southwest, a land developer that is 80% owned by Penn Central, would acquire slightly in excess of 50% of SCC's 1.4 million shares outstanding.

The plan provides that cost of administration and priority claims would be paid in full. Major unsecured creditors would be issued an aggregate of 500,000 shares of common stock in satisfaction of their claims.

The plan is subject to approval by: unsecured creditors; certain secured creditors on various provisions of the plan; and the bankrupcty court at a later date.

SCC closed its doors late in December when it was unable to pay some $200,000 in back wages to its 600 employees. The company has stopped production of both the DCT-132 data communications terminal and the large-scale 6700 computer.

Scientific Control had filed a bankruptcy petition in November under Chapter 11 of the Bankruptcy Act, seeking to remain in business. They were given until Jan. 6 to present a plan for working off their debts. Judge Albert Whitehurst's action has extended that deadline.

Ernest E. Specks, new secretary of the company, stated that SCC has received many offers to purchase the assets of the company, but so far has accepted none.

Specks said the company has assets of $13.4 million and debts of $11 million, including $7.1 million in claims of unsecured creditors.

William J. Rochelle Jr., a Dallas lawyer, is receiver for the company.

It has been reported that among these is a bid by Boothe Computer to buy the manufacturing rights to the successful DCT-132 for $1.5 million.

SCC recently settled its $41 million suit against Commercial Credit Business Loans out of court. Commercial relinquished a license to manufacture and sell the DCT-132 and paid SCC a small amount of money, "in the hundreds of thousands," according to Specks.

SCC had been suing Commercial for failure to consummate a $4.5 million loan.

Applied Logic Shows Loss

PRINCETON, N.J. – Applied Logic Corporation has reported that revenues for the fiscal year ended September 30, 1969, totalled $3,090,109, a 263% increase over the $1,176,080 gross revenues for 1968. Losses for fiscal 1969 were $75,235 or 4 cents per share, compared to earnings of $90,889 or 6 cents per share in 1968.

Earnings Reports

ELECTRONIC ASSOCIATES

Three Months Ended Oct. 3

	1969	1968
Shr Ernd	.....	$.02
Revenue	8,537,155	9,709,016
Earnings (Loss)	(810,853)	62,053
9 Mo Rev	27,422,991	27,388,566
Loss	540,175	455,688

ANALOG DEVICES

Year Ended Nov. 1

	1969	1968
Shr Ernd	$.50	$.44
Revenue	8,765,000	5,750,000
Earnings	616,000	501,000

CONDEC CORP.

Three Months Ended Oct. 31

	1969	1968
Shr Ernd	$.23	$.33
Revenue	23,950,000	24,047,000
Earnings	559,000	720,000

INTERDATA INC.

Nine Months Ended Oct. 3

	1969	a1968
Shr Ernd (Loss)	c$.11	d$(.54)
Revenue	3,817,500	1,366,000
Earnings (Loss)	b161,700	(606,700)

a-Nine months ended Sept. 30, 1968; b-Does not reflect provisions for Federal income taxes in view of the tax loss carry-forward available to the company; c-Net income per share based on the average number of common shares and common equivalent shares outstanding during the period; d-Net loss per share based on the average number of shares outstanding during the period. This report is unaudited.

ANDERSON JACOBSON, INC.

Six Months Ended Sept. 30

	1969	1968
Shr Ernd	$.15	$.02
Revenue	2,199,692	392,628
Earnings	260,051	30,467

KALVAR CORP.

Six Months Ended Sept. 27

	1969	a1968
Shr Ernd	$.62	$.01
Revenue	2,277,600	2,071,000
Earnings	184,200	2,500

a-Six months ended on Sept. 28, 1968. This report is unaudited.

WANG LABORATORIES

Three Months Ended Sept. 30

	a1969	a1968
bShr Ernd	$.14	$.11
Revenue	5,466,228	4,368,337
Earnings	541,188	416,228

a-Restated by company; b-Adjusted for a two-for-one stock split in November, 1969.

New Registrations

NEURO-DATA, INC., 666 Anderson Ave., Cliffside Park, N.J. 07010, a company that intends to engage in the design, development, manufacture, and marketing of special purpose computers, principally for medical diagnosis and other scientific applications, filed to register 100,000 shares of common stock. Proceeds, at $10 per share, intended for production of the company's computer systems; for salaries and opening and operating three regional offices; for advertising and sales promotion; for working capital. No underwriter is involved.

COMPUGRAPHIC CORP., Industrial Way, Wilmington, Mass. 01887, a company engaged in the development, manufacture, and marketing of equipment used in typesetting systems, including special purpose computers for hyphenation and justification and phototypesetting machines used in printing newspapers and other publications, filed to register 369,300 shares of common stock. Proceeds, at $16 per share maximum, intended for repayment of an outstanding 11% subordinated note issued to finance construction of an addition to the company's Wilmington, Mass., plant and for working capital requirements; for repayment of outstanding short-term bank loans; for working capital purposes. The underwriter is G.H. Walker & Co., Inc., 45 Wall St., New York, N.Y. 10005.

AUTOMATED BUSINESS RECORDS CORP., 525 Northern Blvd., Great Neck, N.Y. 11021, a company that provides an automated (computerized) business record keeping service for the professional accountant and the general business community, filed to register 125,000 shares of common stock. Proceeds, at $5 per share, intended for leasing, decorating, and furnishing several automated record keeping centers; for salaries of personnel to operate the centers; for an advertising and promotion campaign; for organizing and conducting the operations of a proposed business forms division; for preparation and promotion of a nationwide franchising program for the record keeping centers; for development and promotion of a proposed merger/acquisition consulting and listing service for small businesses; for working capital and general corporate purposes. No underwriter is involved.

DATA PRODUCTS CORP., 6219 De Sota Ave., Woodland Hills, Calif. 91364, a company engaged principally in the design, development, manufacture, and sale of peripheral and other EDP equipment for use with computers and other data handling systems, and data and voice telecommunications systems and equipment for the transmission of data over telephone lines and radio circuits, filed to register $12,500,000 of convertible subordinated debentures, due 1995. The company owns a 66% interest in Data Card Corp., which proposes to engage in the design, manufacture, and marketing of equipment to emboss and encode plastic credit cards. Proceeds intended to invest about $2 million in Data Card and to repay short-term bank debt. The underwriter is A.G. Becker & Co., Inc., 120 S. LaSalle St., Chicago, Ill.

DATA DISPLAY SYSTEMS, INC., 31 Union Square West, New York, N.Y. 10008, a company that develops and markets digital and analog computer services related to non-linear processing of various signals, filed to register 175,000 shares of common stock. Proceeds, at $7 per share maximum, intended for laboratory equipment, research and development, promotion and working capital. The underwriter is F.S. Donahue, Santo & Co., Red Bank, N.J.

COMPUTERIZED HEALTH SYSTEMS & SERVICES, INC., Cimarron Bldg., 1225 W. Main St., Norman, Okla., a company that offers, through regional centers, a broad range of supplies, management, and financial services to medically oriented institutions, primarily nursing homes, filed to register 400,000 shares of common stock. Proceeds, at $5 per share, intended for the initiation of the company's proposed business activities, including the possible establishment of up to eight regional units. The underwriter is John Kirvin & Co., 55 Broad St., New York, N.Y.

MEDITEK INFORMATION SYSTEMS, INC., 180 State Highway, 35 Red Bank, N.J. 07701, a company that proposes to design, program, implement, and maintain computerized hospital information systems for the purpose of automating the flow of information required for all of the principal services of a hospital, filed to register 150,000 shares of common stock. Proceeds, at $6 per share maximum, intended to be applied to sales activities, to development of a hospital information system for the company's initial customer, and to working capital requirements. The underwriter is Michael G. Kletz & Co., Inc., Time & Life Bldg., New York, N.Y. 10020.

FUTURISTIC APPLICATIONS CORP., 50 Galesi Drive, Wayne, N.J. 07470, a company engaged in developing computer program systems for use with relatively inexpensive computers, primarily for security brokers, and that intends to develop such systems for other commercial applications, filed to register 165,000 shares of common stock. Proceeds, at $3 per share, intended for the repayment of outstanding loans; for employment of additional personnel, administrative, and overhead expenses; for working capital, and for general corporate purposes. The underwriter is Daniel S. Brier & Co., Inc., 80 Broad St., New York, N.Y. 10004.

COMPUTER STOCKS: TRADING SUMMARY

NYSE AND ASE CLOSING PRICES JAN. 9; OTC, JAN. 8

COMPUTER SYSTEMS

EXCH	1969 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK % CHANGE
N	169-120	167 1/4	BURROUGHS CORP	+ 8 1/2	+ 5.35
N	69- 33	35 1/8	COLLINS RADIO	- 1 1/4	- 3.44
N	159-111	116 1/2	CONTROL DATA CORP	- 2 3/4	- 2.31
A	109- 54	107 3/8	DIGITAL EQUIPMENT	+ 2 1/2	+ 2.38
N	25- 9	10 3/4	ELECTRONIC ASSOC.	+ 1/8	+ 1.18
N	98- 73	73 1/8	GENERAL ELECTRIC	- 3 1/2	- 4.57
N	114- 75	106 1/2	HEWLETT-PACKARD CO	+ 4 1/8	+ 4.03
N	157-107	142	HONEYWELL INC	- 1 1/2	- 1.05
N	370-291	369	IBM	+ 4 1/4	+ 1.17
N	163-108	162 3/4	NCR	+ 2 1/4	+ 1.40
N	48- 32	33 1/4	RCA	- 1 1/4	- 3.62
N	50- 30	31	RAYTHEON CO	- 2 1/4	- 6.77
O	43- 1	6	SCI. CONTROL CORP.	+ 3 1/4	+118.18
N	55- 36	38 1/4	SPERRY RAND	+ 1	+ 2.68
A	53- 26	45 1/4	SYSTEMS ENG. LABS	- 2 3/8	- 4.99

PERIPHERALS & SUBSYSTEMS

EXCH	1969 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK % CHANGE
N	85- 57	57 7/8	ADDRESSOGRAPH-MULT	- 2 3/8	- 3.34
O	71- 12	13 1/4	ALPHANUMERIC	- 1/2	- 3.64
N	49- 32	45 1/4	AMPEX CORP	- 2 3/8	- 4.99
O	19- 9	10 3/4	BOLT,BERANEK & NEW	+ 1/2	+ 4.88
N	17- 9	13 1/8	BUNKER-RAMO	- 1 1/8	- 7.89
A	37- 18	25 1/4	CALCOMP	- 2 1/2	- 9.01
O	38- 11	13 1/2	COGNITRONICS	- 1/4	- 1.82
A	16- 7	10 7/8	COMPUTER EQUIPMENT	+ 1/8	+ 1.16
A	27- 12	23 1/2	DATA PRODUCTS CORP	- 1/2	- 2.08
O	22- 13	13 1/4	DIGITRONICS	- 1/4	- 1.85
N	85- 32	35 1/8	ELECTRONIC M & M	- 3 1/2	- 9.06
O	18- 5	6 7/8	FABRI-TEK	+ 7/8	+ 14.58
O	37- 13	16 3/4	FARRINGTON MFG	- 1/8	- 0.74
O	21- 10	18 1/2	INFORMATION DIS	+ 3 1/2	+ 23.33
A	77- 17	76	MILGO ELECTRONICS	+ 8 5/8	+ 12.80
A	89- 59	77 5/8	MOHAWK DATA SCI.	+ 4 3/8	+ 5.97
O	118- 42	51	OPTICAL SCANNING	- 2	- 3.77
O	31- 15	15 3/8	PHOTON	- 1 5/8	- 9.56
A	46- 23	36 1/4	POTTER INSTRUMENT	- 1 3/8	- 3.65
O	76- 54	74	RECOGNITION EQUIP	- 1/2	- 0.67
N	61- 22	28 1/8	SANDERS ASSOCIATES	+ 1 1/4	+ 4.65
O	85- 28	52	SCAN DATA	+10	+ 23.81
O	36- 15	18 1/2	TALLY CORP.	+ 1	+ 5.71
N	115- 85	106 7/8	XEROX CORP	+ 2 3/8	+ 2.27

SUPPLIES & ACCESSORIES

EXCH	1969 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK % CHANGE
O	47- 31	43	ACME VISIBLE	+ 1/2	+ 1.18
N	22- 11	13 3/4	ADAMS-MILLIS CORP	- 3/8	- 2.65
O	27- 20	21	BALTIMORE BUS FORM	---	----
A	29- 17	23 1/4	BARRY WRIGHT	- 1/2	- 2.11
O	44- 26	33 1/4	DATA DOCUMENTS	+ 3/4	+ 2.31
N	42- 17	19	ENNIS BUS. FORMS	+ 1/2	+ 2.70
N	173- 65	156 3/4	MEMOREX	+ 8 3/4	+ 5.91
N	118- 94	113 1/4	3M COMPANY	+ 3 5/8	+ 3.31
O	39- 29	35 3/4	MOORE BUS FORMS	- 1/4	- 0.69
N	49- 36	37 3/4	NASHUA CORP.	- 1 7/8	- 4.73
O	48- 30	47 1/4	REYNOLDS & REYNOLD	+ 2 1/4	+ 5.00
O	31- 23	29 1/2	STANDARD REGISTER	- 1	- 3.28
N	36- 25	36	UARCO	+ 1 1/8	+ 3.23
A	24- 10	22	WABASH MAGNETICS	- 1 3/8	- 5.88
O	40- 28	40	WALLACE BUS FORMS	---	----

SOFTWARE & EDP SERVICES

EXCH	1969 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK % CHANGE
O	14- 4	5	ADVANCED COMP TECH	+ 1/2	+ 11.11
A	32- 19	22 5/8	APPLIED DATA RES.	- 7/8	- 3.72
O	19- 6	7 1/4	ARIES	- 3/4	- 9.38
A	122- 35	43 1/4	AUTOMATIC DATA PRC	+ 3/8	+ 0.87
O	16- 7	13 1/2	AUTO SCIENCES	- 1/2	- 3.57
O	17- 7	9 1/4	BRANDON APPL SYS	+ 1	+ 12.12
A	21- 9	11 3/4	COMPUTER APPL	+ 3/8	+ 3.30
O	16- 6	14 1/2	COMPUTER ENVIRON	+ 1 1/2	+ 11.54
O	47- 11	13 1/2	COMPUTER NETWORK	+ 1/2	+ 3.85
N	34- 19	31 5/8	COMPUTER SCIENCES	- 2 3/8	- 6.99
O	40- 7	8	COMPUTER USAGE	+ 1/4	+ 3.23
A	72- 37	67 1/2	COMPUTING & SOFT	+ 2	+ 3.05
O	24- 3	3 3/4	DATAMATION SERVICE	+ 1/4	+ 7.14
O	17- 5	6 1/2	DATATAB	+ 3/4	+ 15.04
O	15- 3	3 1/2	DIGITEK	---	----
A	38- 7	10 1/2	ELECT COMP PROG	- 1/4	- 2.33
O	30- 12	20	INFORMATICS	- 3/4	- 3.61
O	22- 4	7 3/4	NAT COMP ANALYSTS	+ 1	+ 14.81
A	50- 23	50 1/2	PLANNING RESEARCH	+ 3	+ 6.32
O A	11- 3	4	PROGRAMMING & SYS	+ 3/4	+ 23.08
O	10- 1	4 1/2	SOFTWARE SYSTEMS	+ 2 1/2	+125.00
O A	37- 2	2 3/4	STRATEGIC SYS	+ 1/4	+ 10.00
O	36- 11	20	TBS COMP CENT INC.	+ 1/2	+ 2.56
O A	12- 3	4 1/2	UNITED DATA CENTER	+ 1 1/4	+ 38.46
N	155- 53	95 1/4	UNIVERSITY COMP.	- 1 5/8	- 1.68
O A	38- 22	26 1/2	URS SYSTEMS	- 1 1/2	- 5.36
O A	16- 6	10 3/4	U.S. TIME-SHARING	+ 3 1/2	+ 48.28

LEASING COMPANIES

EXCH	1969 RANGE	CLOSING PRICE		WEEK NET CHANGE	WEEK % CHANGE
O A	14- 7	8 3/4	BANISTER CONTIN	+ 5/8	+ 7.69
O	45- 23	23 3/4	BOOTHE COMPUTER	+ 3/4	+ 3.26
O	18- 4	6 1/2	COMPUTER EXCHANGE	+ 1/4	+ 4.00
A	34- 10	17 1/2	COMPUTER LEASING	+ 1/4	+ 1.45
O	14- 7	14	CYBER-TRONICS	+ 1 1/2	+ 12.00
A	60- 23	30 5/8	DATA PROC. F & G	- 1/2	- 1.61
O	16- 2	6	DATRONIC RENTAL	+ 1	+ 20.00
A	52- 20	22 1/4	DEARBORN COMPUTER	- 1 1/2	- 6.32
A	16- 8	9 5/8	DPA, INC.	- 1/4	- 2.53
A	45- 16	20 1/4	GRANITE MGT	- 1 3/4	- 7.95
A	28- 12	13	GREYHOUND COMPUTER	- 1/2	- 3.70
N	54- 22	26	LEASCO DATA PROC.	- 3 1/2	- 11.86
O	9- 4	5 1/4	LECTRO COMP LEAS	+ 3/8	+ 7.69
A	57- 16	18	LEVIN-TOWNSEND CMP	- 3/4	- 4.00
O	8- 1	2 3/8	LMC DATA, INC.	+ 1/2	+ 26.67
O	14- 2	3 3/4	MANAGEMENT ASSIST	+ 7/8	+ 30.43
O A	12- 6	7 3/4	NCC LEASING	+ 1/4	+ 3.33
O	34- 3	7 1/2	SYSTEM CAPITAL	+ 2 1/4	+ 42.86
A	28- 13	16 7/8	U.S. LEASING	---	----

Notice to Computerworld Readers

In order to continue improving service to readers, *Computerworld* is using a new system to develop the stock table and trading index. Beginning with this issue, we will print later prices than before. This change required a three-week jump in the summary and index.

RCA Earnings Fall Slightly On Even Sales

NEW YORK – Preliminary figures indicate that RCA's earnings dropped 2% on a slight increase in sales in 1969.

Announcing the year-end figures, company president Robert W. Sarnoff said that per share earnings will be about $2.32, also about 2% below last year.

In 1968 RCA had revenues of $3.1 billion.

The RCA president noted that in its computer business, RCA exceeded its 1969 target in revenues and increased its domestic bookings by more than 40% over the 1968 level. The backlog of orders for RCA Information Systems was about 35% higher than it was a year ago.

Sarnoff attributed the earnings decline to the sharpened downward trend of the economy in the fourth quarter, and particularly in its last six weeks. He said that the same negative pressures can be expected to continue into 1970.

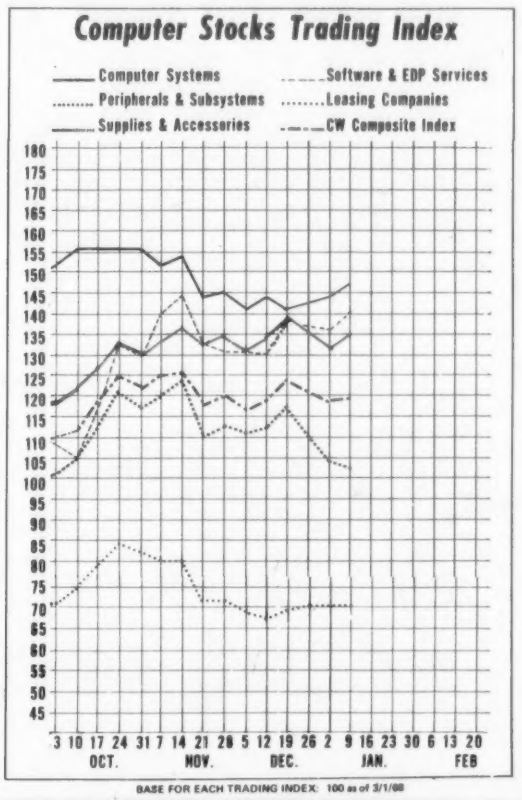
"The problems which have beset the economy may well intensify during the coming months, depressing industrial profits at least through the first half of 1970," he added.

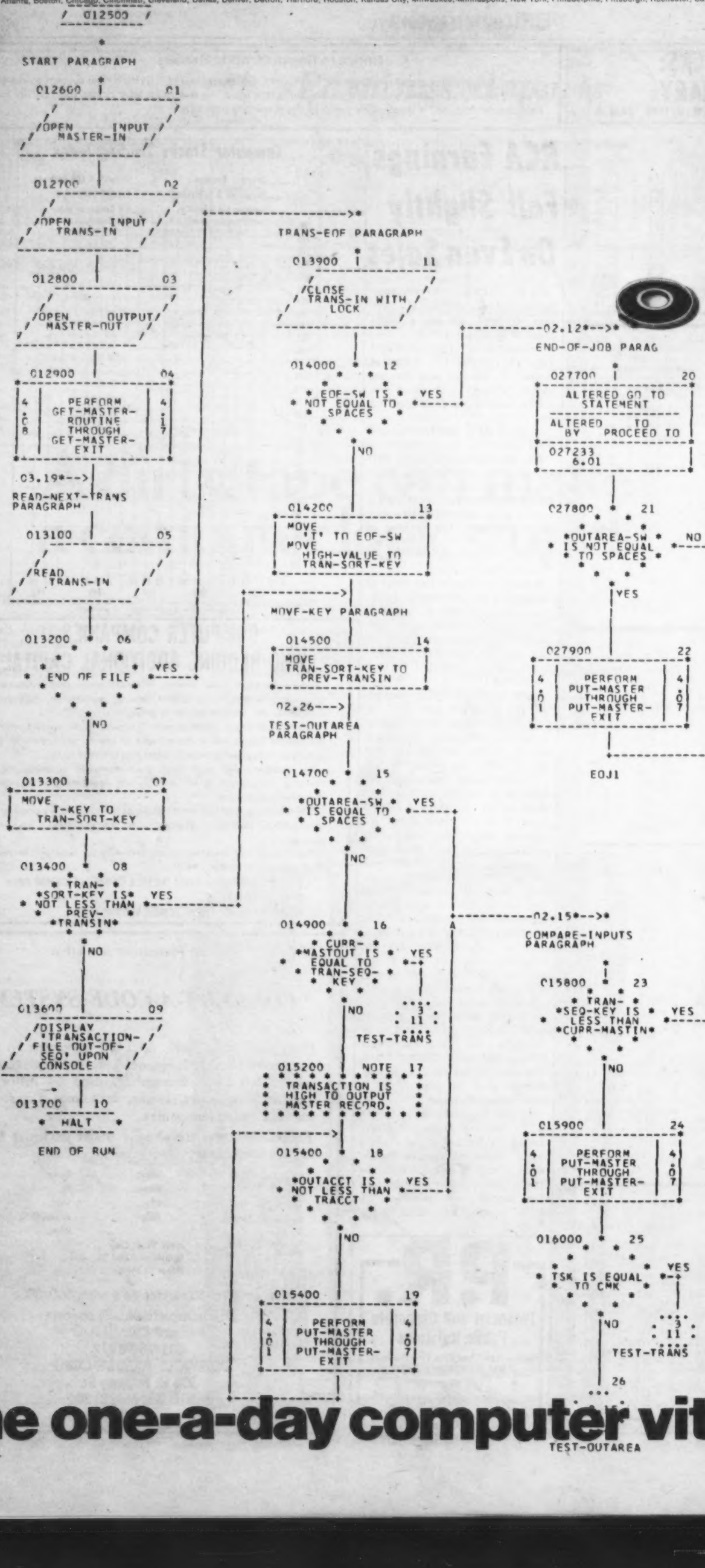
"Inflationary pressures are building somewhat more slowly than earlier in the year. It is clear, however, that some restraints should be maintained until these pressures have been more effectively contained."

As examples of negative pressures, he listed softness in certain categories of commercial electronic equipment as a result of the higher cost of borrowing, and an industry-wide drop in color television set sales in the face of a general decline in durable goods buying.

Among factors helping to offset these weaknesses, Sarnoff cited continued record performances by NBC, The Hertz Corp., and RCA Global Communications, as well as a substantial gain in sales of RCA Information Systems.

He also emphasized the recent $253 million prime contract award to RCA for the Navy's Aegis advanced surface missile system, and he pointed out that the contract might develop into the largest ever received by RCA, possibly exceeding $1 billion.





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